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BATTLESHIP CIRCULAR.

THE NAVY DEPARTMENT INVITE BIDS, WHICH ARE TO BE OPENED OCT. 1—
COMPLETE DESCRIPTION OF THE VESSEL.

The recent naval act passed by congress authorized the construction of two battleships of 16,000 tons, to cost, exclusive of armor and armament, \$4,212,000; and two armored cruisers of 14,500 tons, to cost, exclusive of armor and armament, \$4,659,000 each. One of these battleships is to be built in the New York navy yard. The navy department has just issued a circular to ship builders calling for bids for the construction of the other battleship. The bids are to be opened Oct. 1. The maximum time allowed for completion will be forty-two months and no bid will be considered which proposes to exceed that limit. Failure to complete the vessel within the time specified will involve penalties of \$300 per day for the first month and \$600 per day thereafter. The vessel is to have a speed of 18 knots. If the speed falls below 18 knots on the trial trip and exceeds 17½ knots the vessel will be accepted, so far as speed is concerned, at a reduced price, the reduction being at the rate of \$50,000 a quarter knot deficiency of speed from 18 to 17¾ knots, and at the rate of \$100,000 a quarter knot deficiency of speed from 17¾ to 17½. If the speed falls below 17½ knots the vessel will be rejected, or accepted at a reduced price to be agreed upon by the secretary and the contractor. The general dimensions and features of the vessel are as follows:

Length of load water line	450 ft.
Breadth, extreme, at load water line	76 ft. 10 in.
Displacement on trial, not more than	16,000 tons.
Mean draught to bottom of keel at trial displacement ..	24 ft. 6 in.
Gross draught, full load, about	26 ft 9 in.
Total coal bunker capacity, about	2,200 tons.
Coal carried on trial	900 tons.
Feed water carried on trial	66 tons.

Main battery—Four 12-in. breech-loading rifles; eight 8-in. breech-loading rifles; twelve 7-in. breech-loading rifles.

Secondary battery—Twenty 3-in. 14-pounder rapid-fire guns; twelve 3-pounder semiautomatic guns; six 1-pounder automatic guns; two 1-pounder semiautomatic guns; two 3-in. field pieces; two machine guns of 0.30 caliber; six automatic guns of 0.30 caliber.

The above battery complete will be furnished by the government and will be mounted as follows: The 12-in. guns in pairs, in two electrically controlled, balanced, elliptical turrets, on the center line, one forward and one aft, each with an arc of fire of about 270°. The 8-in. guns in pairs, in four electrically controlled, balanced, elliptical turrets, two on each beam, at each end of the superstructure. The 7-in. guns in broadside, on pedestal mounts on the gun deck behind 7-in. armor, each gun being isolated by splinter bulkheads of nickel steel of from 1½ to 2 in. thick; forward and after guns arranged to fire right ahead and right astern, respectively; other 7-in. guns to have the usual broadside train. The guns of the secondary battery in commanding positions, having a large arc of unobstructed fire, and protected wherever practicable. All the 7-in. guns are so arranged that their muzzles train inside the line of the side armor, thus leaving a clear and unobstructed side when it is desired to go alongside a pier or vessel. Arrangements will be made whereby the 3-in. guns on the main deck can be quickly and conveniently dismounted, housed, and secured, all dismounting gear to be supplied by the contractor. Suitable and well-supported platforms will be provided where necessary for working the guns.

THE TURRETS AND THEIR PROTECTION.

The 12-in. and 8-in. turrets are to be built and fitted complete by the contractor. The hull is to be protected at the water line by a complete belt of armor, 9 ft. 3 in. wide, having a maximum thickness of 11 in. for about 200 ft. amidships. Forward and aft of this the maximum thickness is 9 in. within the limits of magazines, from which points the thickness is gradually decreased to 4 in. at the stem and stern. The lower casemate armor extends to the limits of the magazine spaces and reaches from the top of the water-line belt to the lower edge of the 7-in. gun ports on the main deck, and is 6 in. in thickness, the athwartship bulkheads at the ends of this casemate also being 6 in. thick. The casemate armor around the 7-in. guns on the gun deck is 7 in. thick, and the splinter bulkheads are from 1½ to 2 in. thick. The protection of 3-in. guns is nickel steel 2 in. thick. The upper casemate athwartship armor extending from the shell plating to the 12-in. barbettes is to be 7 in. thick throughout.

The 12-in. barbettes extend from the protective deck to about 4 ft. above the main deck, and consist of 10 in. of armor in front and 7½ in. in the rear above the gun deck. Between the gun deck and protective deck there will be a uniform thickness of 6 in. The barbettes will not have any special framing, the connection of the armor to the decks being sufficient. The 12-in. turrets will have a front plate 12 in. thick, rear plates 8 in. thick, and top plates 2½ in. thick. The 8-in. barbettes will be 6 in. thick in front and 4 in. thick in rear; with the upper tube 3¾ in. thick and the lower tube 3 in. thick. The 8-in. turret front plate will be 6½ in. thick, the rear plates 6 in. thick, and the top plates 2 in. thick. The conning tower and shield will each be 9 in. thick; signal tower 6 in. thick. An armor tube 36 in. in diameter will extend from the base of the conning tower to the protective deck, and will be 6 in. thick throughout. Teak backing of a minimum thickness of 3 in. will be fitted behind all side, athwartship, and 12-in. turret armor; 2 in. of backing to be fitted behind the 8-in turret armor; other armor will be fitted without backing.

There will be a complete protective deck extending from stem to stern, the deck being flat amidship but sloped at the sides throughout, and sloped at each end. It will be built up of 20-lb. plating throughout

with nickel steel of 40 lbs. on the flat and 100 lbs. on the slopes. Cofferdams about 30 in. thick and extending from protective to berth deck level will be worked from end to end of the vessel, these cofferdams being extended above the berth deck, forward and abaft the transverse armor, to a height of about 36 in.

DESCRIPTION OF THE ENGINES AND BOILERS.

The engines will be of the vertical, twin-screw, four-cylinder, triple-expansion type, of a combined indicated horse power of 16,500. The steam pressure will be 250 lbs. The stroke will be 4 ft. The ratio of high-pressure to low-pressure cylinder will be at least 1 to 7, and the diameters will be sufficient for the required indicated horse power at about 120 revolutions per minute. Each engine will be located in a separate water-tight compartment. They will be provided with all the necessary auxiliaries and accessories in accordance with the latest practice of the bureau of steam engineering.

There will be twelve boilers of the Babcock & Wilcox type, placed in six water-tight compartments. They will have at least 1,100 sq. ft. of grate and 46,750 sq. ft. of heating surface, and must be able to furnish steam for the main engines and all the necessary auxiliary machinery and other steam machinery throughout the ship with an average air pressure in the ash pits of not more than one inch of water. All the necessary auxiliaries and accessories will be provided for the efficient working of the boilers. There will be three funnels, each 100 ft. high above the base line. Sixty-six tons of fresh water will be carried on trial in the double bottom or in reserve tanks for use of the water-tube boilers.

The following auxiliary steam machinery of approved make and design, in addition to that pertaining to the main engines and dependencies, is to be supplied by the contractor and installed complete with all piping and fittings: Steering engine; windlass engine; ash-hoist engines for each fireroom; forced-draft blowers; dense-air ice plant with a cooling effect of 3 tons of ice per twenty-four hours; evaporating plant to consist of not less than four units, having a total capacity of 16,500 gallons of fresh water per day; a distilling apparatus capable of condensing at least 10,000 gallons of water per day.

The vessel is to be heated with steam throughout and the usual steam heating system is to be provided and installed by the contractor. The weight of all machinery, tools and spare parts will be about 1,500 tons. The vessel is to be lighted throughout by electricity. The electric plant will consist of eight 100-kilowatt steam-driven generating sets, all to be of 125 volts pressure at the terminals, disposed in two separate and independent dynamo rooms. Six electrically driven generators for power supply to turret-turning motors; 1,100 electric fixtures, complete, with necessary incandescent lamps and outlets; ten inclosed arc lamps located in engine and fire rooms, as directed; six 30-in. search lights mounted on platforms on bridges, with spare parts; two truck lights, with controller and stand complete; electric night signaling sets, diving lamps, ventilating sets, desk and bracket fans, etc., etc. The total weight of the eight steam-driven generating sets, complete, must not exceed 76,000 lbs., or 78.57 tons. The total weight of the whole electric installation, including steam-driven generators, electrically driven generators, search lights, desk and bracket fans, portable ventilating sets, fixtures, arc lamps, switch boards, distribution boards, wiring appliances, conduit and wire for lighting, power, and interior communication circuits, with all fittings, stores, tools, and instruments, must not exceed 406,840 lbs., or 181.7 tons. The total weight of equipment outfit, complete, must not exceed 795,858 lbs., or 355.28 tons.

With the exception of the auxiliaries above mentioned to be operated by steam, all power on board the vessel will be electric, as for instance boat cranes, deck winches, turret turning motors and ventilation blower motors. All electric motors, for whatever purpose, are to be supplied by the contractor.

The Italian minister of posts has arranged the details of the proposed new steamship lines between Italy and China and Australia. The intention is that the China line shall be worked by the Navigazione Generale Italiana, which will receive a subsidy of 300,000 lire for the maintenance of a monthly service between Genoa and Shanghai, independent of the existing line to Bombay, Singapore and Hong Kong. The Australian line will be worked by the Orient Co., which, for a small subsidy, merely undertakes that its steamers shall call at Messina for the export of Sicilian agricultural products.

It is understood that the Pressed Steel Car Co. has just closed contracts to build cars aggregating \$30,000,000 in value. The company is enlarging its capacity, having, through the Clinton Iron & Steel Co., with which it is closely affiliated, bought a large tract of land upon which to erect an open-hearth furnace. The car company is now turning out sixty cars a day to fill an order of 4,000 fifty-ton hopper cars for the Baltimore & Ohio Railway.

The newspapers were more or less full during the week of a story that the Morgan shipping combination had been dissolved and that the White Star and other lines would resume their independent position. The London house of J. P. Morgan & Co. emphatically denies that any breach has occurred. Under the terms of the transfer the completion of the purchase is not to be made until Dec. 31.

The S. Boyer's Sons Co. has been incorporated in New Jersey with a capital stock of \$300,000. The charter of the company permits it to build ships. The incorporators are: James Kaine, Henry Lange, John G. Charles, Peter S. Henderson and John J. Tracy. The temporary address of the company is given as No. 15 Exchange place, Jersey City, N. J.

NEW ANCHOR LINER COLUMBIA.

The new Anchor liner Columbia, which has now successfully completed her maiden voyages across the Atlantic, merits more notice than she has yet received. She was built by D. & W. Henderson & Co., Glasgow, and is one of the largest merchant vessels built on the Clyde. She is by far the largest vessel as yet built for the Anchor fleet and is a notable advance on even the City of Rome, so popular with Americans going to Scotland, but the City of Rome was not originally built for the Anchor service. The Columbia has been especially designed and built for that service and is interesting as being the jubilee vessel of the company, whose first boat was built just fifty years ago. The Columbia is 500 ft. long, 56 ft. broad and 36 ft. 6 in. deep. She has accommodation for 325 first-class passengers, 220 second-class and 600 third-class or steerage; and in addition she carries a cargo of 5,350 tons on a draught of 25 ft., this being limited to enable her to navigate the River Clyde right up to Glasgow.

The vessel is driven by two sets of triple-expansion engines, each set having three cylinders, which are 31½, 51½ and 85 in. in diameter and have a piston stroke of 54 in. The cylinders of each engine are rigidly bolted together and stand on six massive cast-iron columns; the front or inner columns being of rectangular section and divided at the bottom for the double purpose of giving fore-and-aft rigidity to the engines, and also, by permitting the cranks to pass between the column feet, of providing ample room on the starting platform between the two engines. The back columns are of cylindrical section, having sufficient taper in their length to provide ample area at their bases. The sole plates are made in three pieces, bolted together. They are of hollow rectangular section and have strong flanges at the bottom for fixing the engines to the top of the ballast tank. The crank shafts are made in three interchangeable parts and are of the built type. Each part is carried on two bearings of extra length and lined with white metal. The bearings throughout the entire engines are made with extra large surfaces. The crosshead guide plates on the columns are of hollow section, through which cold water circulation is provided. The air-pumps are on Edward's patent system and are fixed to the back columns of the intermediate engines, from the crossheads of which they are driven by means of the usual levers. Attached to the air

there are two complete sets on opposite sides of the ship, either set being capable of lighting the whole ship, as well as driving a large number of powerful electric fans, which are provided for ventilating purposes. The dynamos are driven direct by vertical compound steam engines, the steam and exhaust pipes of which are independent of all other machinery.

The pumping arrangements are on a very complete scale and comprise principally two extra large duplex ballast pumps, one on either side of the engine room. The ballast and bilge pipe connections being in duplicate, there is a complete system on either side of the vessel, with connecting pipes at the after end of engine room. The two pumps may either work independently or both may be connected to draw from any one compartment of the vessel. By this arrangement it will be seen that in the event of a considerable leak occurring in any part of the ship there is ample provision for overcoming it. In addition to these pumps there are two separate duplex pumps for pumping fresh water up to the service tank on the top of the engine casing for supplying the lavatories, galleys, pantries, etc. There is also a duplex pump for the supply of salt water to the sanitary tank and another for fire purposes, in accordance with the requirements of the American authorities. All these pumps are supplied by Messrs. Lamont of Paisley.

Steam is supplied by six large double-ended boilers and one single-ended one. These boilers are on the natural-draft system and are arranged in pairs, with a funnel to each pair, the forward funnel also acting for the single-ended boiler. The funnels are 107 ft. high and have an outer casing throughout their entire length. There are in all thirty furnaces, giving a large heating and fire-grate area. The main steam pipes are led in duplicate, each engine having a separate pipe the whole length of the boiler space. A valve is fitted on the forward side of the forward engine room bulkhead connecting these pipes for the purpose of equalizing the steam pressure of the engines. The placing of the boilers in pairs permits the use of side bunkers throughout the entire boiler space, and these bunkers are of sufficient capacity to steam the vessel across the Atlantic. By this arrangement, with the coal running naturally to the place at which it is required, the necessity of coal trimming is greatly reduced.

For dealing with the large cargo the vessel is designed to carry ten powerful steam winches of the builders' own special make, placed on deck.

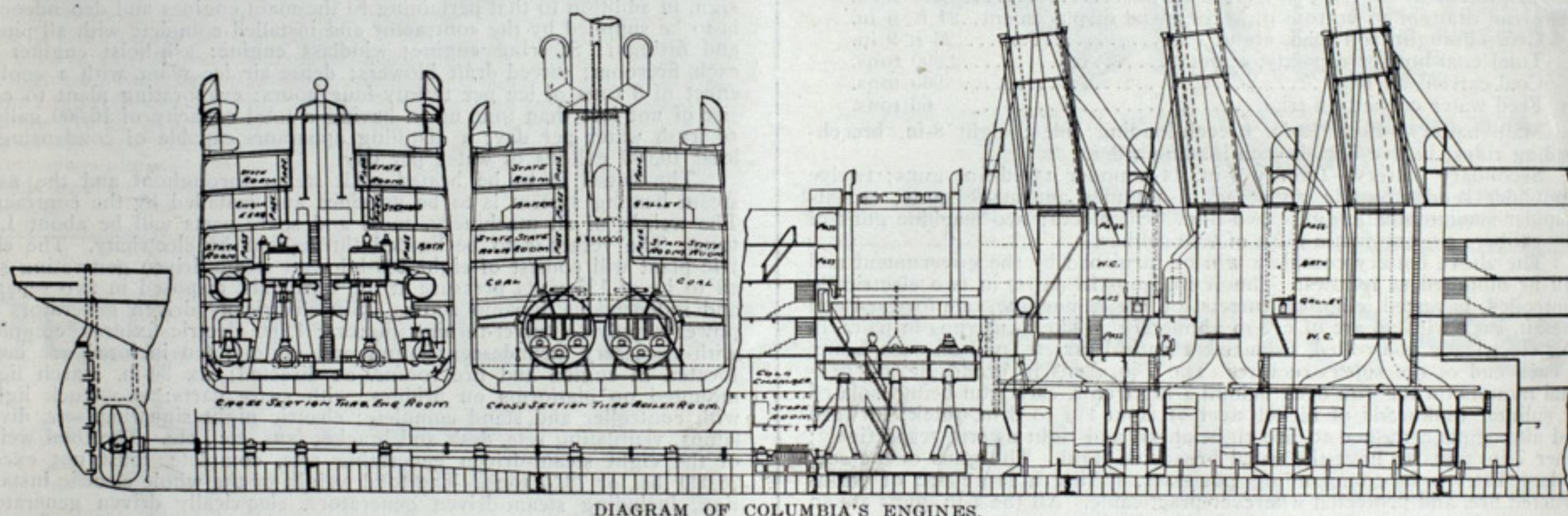


DIAGRAM OF COLUMBIA'S ENGINES.

pump, one at either side, and driven by the same crosshead, are two bilge pumps. The condensers are carried on the lower deck beams close to the side of the ship and quite separate from the main engine structure, and the cold-water circulation through them is supplied by two large centrifugal pumps, driven by vertical steam engines and placed on the level of the starting platform between the low-pressure engines and the ship's side, the diameter of the delivery pipe being 16 in. There are no feed pumps driven direct by the main engines, the whole of the water necessary for feeding the boilers being supplied by two pairs of Weir's feed pumps of large capacity, either pair being sufficient to provide the entire feed water required. There is to each set of pumps a pipe leading from the hot-well to a float tank, with automatic control valve. One pump, taking the water from this float tank passes it through an Alley & MacLellan's "Sentinel" feed filter and then into one of Weir's patent direct contact feed heaters, from which the other pump draws the heated water and delivers it through the main line of feed pipes to the boilers.

To ensure the rapid manipulation of the main engines in narrow waters a direct-acting steam-reversing engine is provided, the cylinder of which is attached to the back of the main cylinders immediately above the wiper shaft, to which it is directly connected, and controlled by levers from the starting platform. The gear for regulating the main stop valves is placed close to the reversing levers. To permit of the accurate adjustment of the main stop valves, a screw gear, worked by a hand wheel, is provided, but in case of emergency by simply pulling a lever the steam can be instantly shut off the engine. At the after end of the engine room is the thrust recess which extends from side to side of the vessel. In it the thrust blocks are secured to steel seats, built upon the ballast tank top. The thrust of each propeller is taken up by collars on the thrust shaft, bearing upon ten horse-shoe rings, having large white-metal bearing surface.

The tunnel shafting is made up in five convenient lengths each, carried on a pillow block having white-metal lining. The propeller shafts, which are carried inside the skin of the ship right up to the stern frame, have on this account to be of extra length, and to avoid corrosion where they are exposed to the salt water in the stern tubes they are covered by gun-metal liners, extending from the fore end of the stern tube to the propeller bosses. The propeller bosses are of cast iron, to each of which are secured, by studs and nuts, four bronze blades, the propellers being 17 ft. 9 in. in diameter.

In the thrust recess, between the two thrust blocks and immediately below the cold storage chamber, is fitted a Hall's patent refrigerator of large capacity. Here also is placed the electrical machinery, of which

They have cylinders of 7 in. diameter and 12 in. stroke, and are provided with winding barrels of extra large diameter. In addition to the large fresh water tanks a large distilling plant for condensing salt water is provided and a separate tubular boiler is fitted in the boiler casing abaft the center funnel for supplying the necessary steam. The steam steering gear is fitted in a special house on the poop and is worked from the bridge by a controlling shaft. It is of Caldwell's make and is of great power. The hand steering-gear is arranged in the same house, and a Cumming's patent oil cylinder rudder brake is also fitted. When recently on her trials on the Clyde the Columbia attained a speed of 18¼ knots, loaded, which is considerably in excess of contract, and everything has worked with the most satisfactory smoothness ever since.

CHICAGO FREIGHT MARKET.

Chicago, Ill., July 30.—Mr. E. J. Fleming of P. H. Fleming & Co., insurance, freight and vessel agents, talking with your correspondent of lake freight conditions, said:

"The Chicago freight market has certainly been very dull during the past week. It has not, of course, been especially active at any time since the season opened, but the demand of late has been about as poor as anything we have experienced for years. Conditions relating to the movement of grain are most peculiar, for the reason that there is a deal on in July corn and another in oats, and either these influences go to affect the wheat market or else there is another deal on in that cereal. However, the tendency is all in the direction of keeping the different grains intact. For the most part grain is being held in Chicago elevators. When it is sold there is a stipulation that it is for consumption and under no circumstances to be re-delivered to this market. This, as you will appreciate, shuts off the consignment of corn, and where under ordinary circumstances shippers would take the chance of sending down a few cargoes to various points, they are now afraid to take any chance whatever. Another condition acting against the movement of grain is that eastern buyers do not coincide with the views of the people behind these corners and they take grain only as a matter of absolute necessity, confining their purchases to the smallest possible amounts. Where inquiries ordinarily came in for 50,000 bushels and upwards, the bids are now for 15,000 lots and in some cases for five cars, etc. Cargo business is accordingly at a standstill, except when the Gates Co. finds it convenient to move out a few hundred thousand bushels of their grain. We see no prospect of a betterment of conditions from the vesselman's standpoint until these unusual influences are entirely removed from our market."

A YEAR'S SHIPPING AND SHIP BUILDING.

INTRODUCTION TO THE 1902 EDITION OF THE BLUE BOOK OF AMERICAN SHIPPING—THE MORGAN SHIPPING COMBINATION—THE DEFEAT OF THE SHIPPING BILL—VESSEL CONSTRUCTION.

There has just been issued from the Marine Review press the 1902 edition of the Blue Book of American Shipping, which is the only marine directory published in the United States. This directory embraces all the trades that are allied to ship building and is invaluable as a work of reference to anyone desiring to cover this varied field. The introduction to the Blue Book is unusually comprehensive this year and epitomizes all that is distinctive in the ship building field. In its introduction the Blue Books says:

"Since the last issue of the Blue Book of American Shipping the country has experienced a period of prosperity to the point of congestion. The country has, indeed, had more business to do than it could reasonably attend to and the inevitable consequence has been that delivery in manufactured lines has been delayed. Iron is the base of the industrial life of this nation, and the demand for iron has steadily exceeded the capacity of the furnaces to produce it. The capacity of mills has also been unequal to the demand, and in nearly all lines of steel manufacture order books are practically filled for the first half of 1903. Owing in part to the scarcity of the stuff out of which ships are made there has been, to some extent, a lessening of orders for new ships over last year. We say to some extent advisedly, because while the number of new orders has been limited in the seaboard yards, the builders of the great lakes have secured about all the new work they can care for until the autumn of 1903. The failure of the shipping bill leaves the seaboard yards with little hope of more ships to be built for the foreign trade, and some orders for new vessels for the coasting trade are undoubtedly withheld on account of the higher prices demanded for ship material. However, the break has already come in Britain where a ship may be built today for 30 per cent. less than it could have been built a year ago. In this country the United States Steel Corporation has acted as a steadying force throughout all the gnawing hunger for iron which every industry has felt. It makes easily two-thirds of the steel that is produced in the United States, and could have raised the price of iron to any figure it pleased, but it exerted its mighty influence to keep prices at an even pitch in the hope that consumption might continue uninterruptedly. The wisdom of this course is apparent, for there is no lessening in the demand, and while prices are high they are by no means as high as they might be—and unquestionably not as high as they would be had not the Steel Corporation been formed.

"It is proper to state that the dramatic event of the year in shipping circles has been the formation of what the newspapers loosely term the Morgan shipping combination. This extraordinary man has combined under one management the White Star, Leyland, Red Star, American, Atlantic Transport and Dominion lines of steamers. This combination was presaged by the acquiring earlier in the year of the Leyland line. The great factor in the combination is the White Star line, as the American, Red Star and Atlantic Transport lines were controlled by interests in close affiliation with Mr. Morgan. The White Star line enters the combination upon a basis of ten times its profits for the year 1900. This figure is very favorable to the stockholders of the White Star line, as the year 1900 was the most profitable in the history of the company. Notwithstanding the fact that the dissolution of the White Star company was merely a private matter—and an extremely profitable one for those who were so fortunate as to be among its shareholders—the affair created the wildest excitement throughout Great Britain, and the company was roundly denounced for surrendering its ships by those who had not a dollar at stake. In this country it killed the shipping bill absolutely as far as the present congress is concerned. The shipping bill had passed the senate with an ease which was quite bewildering to those who had witnessed its death struggle in that body during the preceding year. It went to the house where, upon the Morgan merger following soon thereafter, it was incontinently shelved. We regard this as a peculiarly unfortunate circumstance. The country cannot spring like Jove, full armed, into the possession of an American merchant marine; and yet the average American mortal believes that Mr. Morgan has conferred this blessing upon the nation. In fact Mr. Morgan has subtracted a little less than 4 per cent. of Britain's shipping. The remaining 96 per cent. is well manned and healthful, and running along trade routes that are as automatically established as is the flow of the gulf stream. Of the vessels taken over by the purchase only two of them were built in the United States and only four of them are flying the American flag. The rest, 110 in number, are flying foreign flags, and they cannot be admitted to American register unless the navigation laws are repealed—an extremely unlikely proceeding. An American merchant marine, such as existed in the days of the clipper ship, is as far away as it ever was. We will not say that we will never have an American merchant marine, but we will say that we will not have one for a great many years, unless congress comes to the rescue. The essential point of difference between Britain and the United States in the shipping field is that Britain's shipping is established. It flows along commercial lines formed by necessity and by a century of toil. Trade cannot be diverted from these lines without exceptional advantages—and the exceptional advantage in this case is congressional aid. We have never advocated aid for an indefinite period of time. We advocate it merely for a definite period of existence. A human being does not want swaddling clothes all his life, but when he is a youngster he wants them more than anything else. If aid is given until American trade routes are established it can then be withdrawn without detriment. Indeed to continue it beyond that period would probably be a detriment; but now it is a necessity. Mr. Morgan's ships are largely engaged in the Atlantic passenger service. The amount of cargo which they carry bears a small proportion to the amount which annually leaves these shores. It is the humble freighter, which braves every sea and pokes its nose into every port where freight may be obtained, that we want to favor. The amount of freight which goes abroad in an American bottom is 8 per cent.

"The number of vessels built in the United States during the year ended June 30, 1902, (nearly all for coasting trade, of course, and a very large part of them on the great lakes), was 1,657 of 473,981 gross tons, compared with 1,709 vessels of 489,616 tons for the preceding year. The decline during the year is in sailing vessels, canal boats and barges. This

year the sailing tonnage aggregated 101,072 tons; last year, 128,099 tons. A substantial increase is noted in steel steamers, which aggregate 275,479 tons, as against 235,265 tons for last year. The construction of canal boats and barges declined from 88,331 tons to 57,502 tons.

"No new orders of importance are noted on the seaboard and in this respect the outlook is not as favorable as it was a year ago. During the year the Cramps at Philadelphia launched the Kroonland and Finland for the Red Star line. The Kroonland is already in commission and the Finland will be in a few weeks. These are the largest vessels so far constructed in the United States. The Pacific Mail liners, Siberia and Korea, have also been launched by the Newport News Ship Building & Dry Dock Co. The Korea is now in commission and the Siberia will be before the year is out. These will be the largest vessels engaged in the Pacific trade. The Boston Steamship Co. has built two steamers, Shawmut and Tremont, for the opening trade with the Philippines, which is distinctly foreign trade. These vessels were built by the Maryland Steel Co., Sparrow's Point, Md., and they may be said to be, in a way, fore-runners of the American merchant marine, for they were built for a new trade which is open to foreign vessels. The New York Ship Building Co., Camden, N. J., has launched the Nebraskan and Nevadan for the American-Hawaiian Steamship Co. They are a part of a fleet building for the New York-Hawaiian service via Cape Horn. These orders were all mentioned in last year's Blue Book. It is significant that there are no new orders to take their places.

"In the great lakes district there is every indication of a volume of ship building in 1903 fully equal to the record year now closing. The lake ship builders close their year about mid-summer, as their most active period is the fall and winter. In the year now closing they have built forty-three vessels, costing about \$10,250,000. They already have for the coming year orders for thirty-two vessels that are to cost about \$7,500,000. The American Ship Building Co. alone has orders for twenty-eight ships for next year. This summary does not, of course, take into account any of the small vessels. It refers only to large steel ships. In this whole list of new lake vessels, for the year closing as well as the year to come, only two are tow barges. The lone steamer is supplanting the steamer and its consort. In fact, several large steel tow barges on the lakes have recently been converted into steamers.

"In the last issue of the Blue Book mention was made of the opening of an all-water service between Chicago and Great Britain. The Northwestern Steamship Co. of Chicago placed four steamers on the route. Each of the steamers made one trip and then the enterprise was abandoned. The steamers were taken to the coast and converted into oil tank vessels. During the year two vessels were completed at lake ship yards for transatlantic service. They are the Minnetonka and Minnewaska of 7,000 tons carrying capacity each. As they were too large for the Canadian canals they were constructed in two sections each, towed through the canals and then joined. This feat was successfully accomplished, but it is not probable that any more vessels will be built in this way for some time to come, as the builders were certainly without profit on their order, and the ships upon completion found very unsatisfactory freights in the competitive trade of the Atlantic.

"No new naval contracts were placed during the year. Contracts for one battleship, two armored cruisers and two gunboats, authorized in the last naval act, will be placed shortly. In addition one battleship will be built in the New York navy yard. Independent of these there are fifty-one warships under construction for the United States navy with a total displacement of 264,987 tons, a total horse power of 523,420, and costing for hulls and machinery \$74,731,666."

ENGLAND'S ABILITY AS A SHIP BUILDER.

The London Economist is a strong believer in England's ability to replace promptly all ships taken over by the American combination. It begins by pointing out that Great Britain's present production of ships, even at the moment when the South African tonnage is coming back to the merchant service, breaks all records. These are the figures of the Scotch ship yards alone for the first six months of 1902 and previous years:

	Tons.		Tons.
1902	259,800	1896	201,300
1901	246,700	1895	191,880
1900	232,580	1894	183,500
1899	256,300	1893	132,690
1898	227,600	1892	210,880
1897	159,450	1891	191,000

The Economist continues: "It is interesting to revert to the American project on which we recently commented. The American ship yards turned out between 1890 and 1900 206,000 tons of vessels for the foreign trade—that is to say, in ten years 53,000 tons less than the Clyde ship builders have produced in six months, and practically all for the foreign trade. At the present rate of production the other Scotch yards will have an output of 520,000 tons of iron and steel ships, or considerably more than double the whole output of iron and steel ships in the United States in 1900, including those for the great lakes and coasting trades. In the fiscal year ended June 30, 1900, the American ship yards turned out 488,000 tons of vessels of all kinds, and for inland as well as ocean navigation, or, say, 40,000 tons less than Scotch builders alone will turn out in 1902. The output of all the British yards in 1901 was 1,697,240 tons, and that of the German yards 191,000 tons. At the present time fully one-half of the work in the principal American yards is for the navy, not for the merchant marine. Not more than 2 per cent. of the British output is in warships. It is a curious coincidence that the removals from the British register last year were, according to Lloyd's (vessels sold to foreigners, transferred to colonies, lost and broken up), 488,429 tons, or almost exactly the product of the American yards during the year. That is to say, it would take the full producing capacity of America to make up our wastage each year."

There are now under construction at Howard's Ship Yard, Jeffersonville, Ind., a life-saving station boat house for Louisville, a towboat for Baton Rouge, a steel ferryboat for New Orleans, a transfer steamer for St. Louis, a mail boat for the Tennessee river, and four big sand barges for St. Louis. In the river, being finished, are the steamboats Savannah and Stacker Lee.

IRON PRODUCTION IN THE UNITED STATES.

Nothing reflects the general prosperity of the country in a more striking manner than the condition of the iron and steel industry. In the forthcoming volume of the "Mineral Resources of the United States," issued by the geological survey, James M. Swank, the acknowledged expert on the subject, discusses the statistics of the American iron trade for 1901. Mr. Swank says that the era of unexampled prosperity in the industries of this country, which may be said to have ushered in at the beginning of 1899, when an active demand for iron and steel was developed, accompanied by a raising price, has continued from that day to this, and at no time has been more fruitful of good results than at the time of his writing in May, 1902. He maintains that the use of iron and steel in almost every form increases at a greater ratio than the increase in population, and the use of steel for high buildings, for the manufacture of steel cars and for the construction of steel vessels is sure to call for an increasingly large tonnage from year to year. It may not be generally known that steam and trolley railroads consume in rails, cars, locomotives, bridges, buildings and electrical machinery fully one-third of all the iron and steel made in the United States. The leading statistical results of the year 1901 concerning the iron and steel trade and the related industries are given below, compared with the statistics of the same industries for 1900—the first year of the twentieth century, compared with the last year of the nineteenth century.

In 1901 the United States produced 15,878,354 long tons of pig iron, 8,713,302 long tons of Bessemer steel ingots, 4,656,309 long tons of open hearth steel and 13,473,595 long tons of steel of all kinds, and rolled, in all, 12,349,327 long tons of finished iron and steel, including rails. The comparative figures for 1900 are:

	Long tons.
Pig iron	13,789,242
Bessemer steel ingots	6,684,770
Open hearth steel	3,398,135
Steel of all kinds	10,188,329
Rolled iron and steel, including rails	9,487,443

In 1901 there were mined 28,887,479 long tons of iron ore, and there were shipped 20,589,237 long tons of Lake Superior iron ore, 12,609,949 short tons of Connellsville coke and 1,279,972 short tons of Pocahontas coke. For 1900 the comparative figures are:

	Long tons.
Total production of iron ore	27,553,161
Shipments of Lake Superior ore	19,059,393
	Short tons.
Connellsville coke shipments	10,166,234
Pocahontas coal shipments	1,341,444

It will be observed that in 1901 the total production of iron ore increased 1,334,318 long tons, the shipments of Lake Superior ore increased 1,529,844 long tons, and the shipments of Connellsville coke increased 2,443,715 short tons; that the production of all kinds of pig iron increased 2,089,112 long tons; the production of Bessemer steel increased 2,028,532 long tons; open hearth steel, 1,258,174 long tons; all kinds of steel, 3,285,266 long tons; structural shapes, 187,989 long tons, to a total of 1,013,150 long tons; plates and sheets, 459,897 long tons, to a total of 2,254,425 long tons; Bessemer steel rails, 487,162 long tons, to a total of 2,870,816 tons; iron and steel wire rods, 519,643 long tons, to a total of 1,365,934 long tons, and all kinds of rolled iron and steel, 2,861,884 long tons.

There was a small decrease in 1901 in the production of iron and steel cut nails, but an increase of 2,569,843 kegs in the production of iron and steel wire nails. The increase in the production of tin plates andterne plates amounted to 96,626 long tons. The increase in the mileage of new railroads was 5,368 miles, as compared with 4,157 miles of new railroads built in 1900.

The total value at the mines of the iron ore produced in 1901 was \$49,256,245, or an average value of \$1.71 a long ton, as compared with a value for 1900 of \$66,590,504, or an average value of \$2.42 a long ton. The average price in 1901 of grey forge pig iron at Pittsburgh was \$14.20 a long ton, as compared with \$16.90 in 1900; of Bessemer pig iron, \$15.93 a ton in 1901, as against \$19.49 in 1900; of steel rails at mills, in Pennsylvania, \$27.33 a ton in 1901, as against \$32.29 in 1900.

The production of anthracite coal in Pennsylvania in 1901, including coal mined for colliery consumption amounted to 60,242,560 long tons, as compared with 51,221,353 long tons in 1900. The total production of coal in 1901, as at present ascertained, amounted to 261,525,435 long tons, as compared with 240,965,917 tons in 1900. The total production of coke in 1901, as at present ascertained, amounted to 21,789,945 short tons, as compared with 20,533,348 short tons in 1900. The average price of coke in 1901 was \$1.95 a short ton, as compared with \$2.31 in 1900, and the total value of the coke produced in 1901 was \$24,589,400, as compared with \$27,448,832 in 1900.

The total imports of iron and steel, including machinery, cutlery, fire-arms, etc., for which weights are not obtainable, amounted in foreign value to \$20,394,995 in the calendar year 1901, as against \$20,443,011 in 1900 and \$15,800,579 in 1899, a decrease in 1901 as compared with 1900 of \$48,916. The total exports of iron and steel, which include locomotives, car wheels, machinery, castings, hardware, saws, tools, sewing machines, stoves, printing presses, boilers, etc., amounted in the calendar year 1901 to \$102,534,575, as against \$129,663,480 in 1900, \$105,690,047 in 1899, \$82,771,550 in 1898 and \$62,737,250 in 1897. Exports of iron and steel more than doubled in value from 1897 to 1900, but there was a shrinkage in 1901, as compared with 1900, of \$27,098,905, or over 20 per cent. In the early part of the calendar year 1901 exports of iron and steel were well maintained, but there has been a great decrease in exports, caused entirely by the decline in prices abroad and the revival of an active demand at home. Exports of agricultural implements, which are not included in the iron and steel exports already given, amounted in the calendar year 1901 to \$16,714,308 against \$15,979,909 in 1900, \$13,594,524 in 1899, \$9,073,384 in 1898, and \$5,302,807 in 1897. These exports increased in value three fold in the five years from 1897 to 1901, inclusive.

In the fiscal year ended June 30, 1900, there were built in the United States ninety steel vessels, with a gross tonnage of 196,851, and in the fiscal year of 1901 there were built 119 steel vessels and one iron vessel, with a gross tonnage of 262,699. In the first nine months of the fiscal year 1902, ended March 31, there were built eighty-four steel vessels, with

a gross tonnage of 151,340. Vessels for the United States navy are not included in the figures here given.

Counting the metric ton as the virtual equivalent of the long ton, we obtain in round figures approximately accurate totals for the world's production in 1900, as follows:

	Long tons.
Iron ore	90,000,000
Coal	760,000,000
Pig iron	40,400,000
Steel	27,430,000

Of the total world's production of iron ore in 1900 the United States contributed over 30 per cent.; of coal, over 31 per cent.; of pig iron, over 34 per cent.; of steel, over 37 per cent. It is almost unnecessary to add that the United States produced in 1901 a much larger percentage of the world's production of iron ore, coal, pig iron and steel than it did in 1900, its production of iron ore in 1901 having increased 1,334,318 long tons; its production of pig iron, 2,089,112 long tons; its production of steel, 3,285,266 long tons, and its production of coal, as at present ascertained, 20,559,518 long tons.

LAKE SHIP YARD MATTERS.

Some doubt is now expressed in lake ship building circles as to whether the two large side-wheel passenger steamers planned for the Detroit & Cleveland line will be built for next year. No positive announcement regarding the closing of a contract has been made by either the Detroit Ship Building Co. or the steamboat company, but statements from the officials of both organizations still leave the impression that the vessels will be built and that they will be considerably larger than any of the several magnificent side-wheelers which the Detroit company has built of late years for the Detroit & Cleveland and Detroit & Buffalo lines. Even if the construction of these steamers is put off for another year, the Detroit yard, alike to all other yards of the American Ship Building Co., will, of course, have plenty of work in the building of freighters, for which orders are already almost sufficient in number to keep all the works employed until the opening of navigation next spring. Berths in the Globe yard, Cleveland, will not be fully employed throughout the winter with the new work thus far assigned to them, but it is probably the intention of officials of the American company to use the Cleveland yard as far as possible for repairs.

The new dry dock of the Collingwood Ship Building Co., Ltd., Collingwood, Ont., on which work was started a few days ago, will be slightly over 500 ft. long by 78 ft. broad at top, and will have 15 ft. of water over the keel blocks. This dock will be ready for operation in the spring of 1903. Two steel freight steamers to be built by the Collingwood company for Canadian interests, and which are to be completed for the opening of navigation next spring, will be modern in all respects. The first, for the St. Lawrence & Chicago Steam Navigation Co., Ltd., Toronto, will be 375 ft. over all, 358 ft. keel, 48 ft. beam and 28 ft. depth. The second vessel is for the Midland Navigation Co. of Midland, Ont. (James Playfair), and will be 369 ft. over all, 352 ft. keel, 48 ft. beam and 28 ft. deep. Both vessels will be fitted with triple-expansion engines having cylinders of 20, 33 and 54 in. diameter and 40 in stroke. Steam will be supplied in each case at 180 lbs. pressure from two 14-ft. Scotch boilers.

SHIPPING PERSONNEL IN SEABOARD TRADE.

Reports to the bureau of navigation show that during the past fiscal year shipping commissioners at the seaboard shipped 108,554 men on American vessels. Of this number 65,859 were shipped on steam vessels, 42,695 on sail vessels. In the foreign trade 49,060 men were shipped; in the coasting trade, 59,494. These figures include the repeated shipments of the same men on different voyages of the same vessels. The number of individual seamen involved did not exceed 20,000. The nationality of the men shipped was: Born Americans, 34,957; naturalized Americans, 14,915; Norwegians, Swedes and Danes, 16,315; British, 13,897; Germans, 5,640; Italians, 2,297; French, 576; other nationalities, 19,957. The principal "other nationalities" are Spanish, Russians, Portuguese, Australians and unclassified West Indians. These figures also include repeated shipments. Chinese are not shipped on American vessels in American ports, but 521 were shipped at Hong Kong before United States consuls. The amount of wages disbursed during the year under shipping commissioners' supervision was approximately \$2,500,000. The average monthly wages paid to men of all ratings, excluding masters, during the year on American vessels was: Passenger steamers, \$36.88; freight steamers, \$42.46; square-rigged vessels, \$28.94; schooners in the foreign trade, \$29.12; schooners in the coasting trade, \$33.63; the average wages for all being \$35.11, or usually \$316 a year. In American ports 3,993 men, or less than 4 per cent., failed to join their vessels.

Secretary Moody's reported purpose to take into account the cost of educating naval officers at Annapolis, as well as their average receipts on retired pay, in estimating the cost of their services in supervising the construction of the battleship Connecticut at the Brooklyn navy yard, indicates no disposition to put the present experiment to an unfair test. This consideration, he believes, should be taken into account in all work which navy officers do, in competition or by comparison with the work of civil life, and when it is often remarked that things could be done cheaper by the navy officer, full account is not always taken of such difference in the terms of compensation as these. Mr. Moody's aim is to secure exactness in bookkeeping, in order that the present experiment may have an absolutely fair trial. It is acknowledged, even by its opponents, that conditions are much more favorable to a successful result now than when the Maine and the Texas were built. The equipment of the government navy yards is better and the efficiency of the service has been increasing. The Brooklyn yard, as noted at the time of its selection, promises better than others on the coast. The present estimate about the department is that the cost of construction in the government yard will be about 20 per cent. higher than by private contracts.

The William R. Trigg Co., Richmond, Va., has just been awarded a contract for building a large ocean-going steel tug for the New York, Philadelphia & Norfolk Railway. Dimensions of the tug are: Length, 122 ft.; beam, 25 ft.; depth, 12 ft.

PRODUCTION OF PIG IRON.

The American Iron and Steel Association has received from the manufacturers complete statistics of the production of all kinds of pig iron in the United States in the first half of 1902; also complete statistics of the stocks of pig iron which were on hand and for sale on June 30, 1902. It is a gratification, says the association, to be able to state that every manufacturer of pig iron in the country, without a single exception, has responded to the association's request for information. The statistics are, therefore, of special interest.

The production of pig iron in the first half of 1902 was 8,808,574 gross tons, against 7,674,613 tons in the first half of 1901 and 8,203,741 tons in the second half of 1901. The increase in production in the first half of 1902 over the second half of 1901 was 604,833 tons. The united production of the second half of 1901 and the first half of 1902 amounted to 17,012,315 tons. It is possible that the production of the whole year 1902, notwithstanding the interruption to furnace activity caused by the anthracite strike, may exceed 18,000,000 tons. The production of pig iron by the United States in the first half of 1902 was in round figures 1,000,000 tons greater than the production of either Great Britain or Germany in the whole year 1901, the total production of these countries in that year being respectively 7,761,830 and 7,736,663 gross tons.

The production of Bessemer pig iron in the first half of 1902 was 5,105,932 gross tons, against 4,582,187 tons in the first half of 1901 and 5,014,606 tons in the second half of 1901. The figures for 1902 include 81,818 tons of low-phosphorus pig iron. In 1901 the production of low-phosphorus pig iron was not separately ascertained, but is included with Bessemer pig iron. The production of basic pig iron in the first half of 1902 was 1,053,274 gross tons, against 645,105 tons in the first half of 1901 and 803,745 tons in the second half of 1901. The production of charcoal pig iron in the first half of 1902 was 186,098 gross tons, against 194,231 tons in the first half of 1901 and 165,916 tons in the second half of 1901. In addition there were produced in Tennessee in the first six months of this year 6,004 tons of pig iron with mixed charcoal and coke. The production of spiegeleisen and ferromanganese in the first half of 1902 was 118,982 gross tons, against 135,920 tons in the first half of 1901 and 155,541 tons in the second half of 1901.

The association statistics of unsold stocks do not include pig iron sold and not removed from the furnace bank, or pig iron manufactured by rolling-mill owners for their own use, or pig iron in the hands of consumers. The stocks which were unsold in the hands of manufacturers or their agents on June 30, 1902, amounted to 29,861 tons, against 70,647 tons on December 31, 1901, and 372,560 tons on June 30, 1901. In addition to the 29,861 tons above mentioned the American Pig Iron Storage Warrant Co. had in its yards on June 30, 1902, 1,000 tons of pig iron, of which 800 tons were coke and 200 tons were charcoal pig iron. The manufacturers had parted with the control of this 1,000 tons. We have never before recorded such small stocks of unsold pig iron as the figures for June 30 represent.

The whole number of furnaces in blast on June 30, 1902, was 286, against 266 on Dec. 31, 1901, and 259 on June 30, 1901. The number idle on June 30, 1902, was 125.

On June 30 there were twenty-eight blast furnaces in course of erection in the United States, of which twenty-four will use coke for fuel when completed, two will use anthracite coal and coke mixed, and two will use charcoal. These furnaces are located in the following States: New York, four coke; New Jersey, one anthracite and coke; Pennsylvania eleven, of which one in the Lehigh valley will use anthracite and coke, and six in Allegheny county, one in the Shenango valley, and three in other counties in western Pennsylvania will use coke exclusively; Virginia, one coke; West Virginia, one coke; Tennessee, one charcoal; Alabama, two coke; Ohio, two coke, one at Cleveland and one at Toledo; Illinois, one coke; Michigan, one coke and one charcoal; and Colorado, two coke. A few of these furnaces will be completed and blown in before the close of 1902, but the majority will not be ready for blast until 1903. In addition to the new furnaces enumerated above, several coke furnaces are projected and a number of old furnaces are to be rebuilt during 1902 and 1903.

The production of pig iron in 1901 with anthracite and mixed anthracite coal and coke was 1,712,527 tons, or less than one-ninth of the total production, and of the entire anthracite and mixed anthracite coal and coke production of the year only 43,719 tons were made with anthracite alone. The production of pig iron with anthracite and mixed anthracite and coke in the first six months of 1902 amounted to 733,740 tons, against 847,503 tons in the second half of 1901, and the production with anthracite alone amounted to 15,990 tons. These figures, reinforcing those above given for 1901, and in the face of an immense total production of pig iron in the first six months of 1902, show that this country can get along without anthracite coal in its blast furnaces, although it will fare better with it. Coke is now being wholly substituted for mixed anthracite and coke in a number of furnaces which have heretofore used the mixed fuel.

CANADIAN FAST SERVICE DEVELOPING.

A dispatch to the London Times from Montreal says that it is understood that the Canadian Pacific Railway at the request of the Canadian ministers, now in London, has telegraphed an offer to establish and work a weekly fast passenger service, composed of four steamers, with the most modern equipment and with a speed of 20 knots an hour, between Quebec and Liverpool in the summer, and Halifax and Liverpool in the winter, together with a freight service comprising ten or eleven steamers of good speed, fitted with cold storage and all other modern appliances. Sir Thomas Shaughnessy admits that a tender has been made by the Canadian Pacific to the government. Beyond this he will not say but it is based upon an annual subsidy of \$1,500,000. Of this sum Canada long ago offered \$750,000. While no definite announcement has been made by the British government, there is every indication that a Canadian fast service is assured. It is quite likely that a formal statement will be issued in a few days.

The navy department announces that the battleship Maine will be given an official trial over the Cape Ann course on Aug. 18.

SHIP BUILDING IN THE UNITED KINGDOM.

From returns compiled by Lloyd's register it appears that, excluding warships, there were 406 vessels of 1,129,582 tons gross under construction in the United Kingdom at the close of the quarter ended June 30, 1902. Particulars of the vessels in question are as follows, similar details being given for the corresponding period of 1901 for the purpose of comparison:

Description.	June 30, 1902.		June 30, 1901.	
	No.	Gross tonnage.	No.	Gross tonnage.
STEAM.				
Steel	379	1,107,605	409	1,287,366
Iron	1	200	2	380
Wood and Composite	1	160	2	72
Total	381	1,107,965	413	1,287,818
SAIL.				
Steel	12	20,428	15	10,948
Iron
Wood and composite	13	1,189	13	1,413
Total	25	21,617	28	12,361
Total Steam and Sail	406	1,129,582	441	1,300,179

The present return shows a reduction in the tonnage under construction of about 111,000 tons as compared with the figures for last quarter, and of about 284,000 tons as compared with the unprecedentedly high total which was reached in September last. During the quarter 153 steam vessels of 294,460 gross tons and twelve sailing vessels of 10,005 gross tons were begun; and 167 steam vessels of 390,218 gross tons and twelve sailing vessels of 11,747 gross tons were launched.

Lloyd's register of British and foreign shipping for 1902-3, which is just out, shows that British and foreign steamers and sailing vessels of over 100 tons each have increased during the past year from 29,091 vessels of 30,600,510 tons gross to 29,628 of 32,437,763 tons gross. The following table shows the growth of the tonnage of the different nations:

	1902		1901	
	Steamers. Tons gross.	Sailing ships. Tons net.	Steamers. Tons gross.	Sailing ships. Tons net.
British	13,652,455	1,894,442	12,739,180	1,969,026
United States	1,954,168	1,382,988	1,704,159	1,373,188
Argentine	67,341	28,328	58,520	26,770
Austro-Hungarian	529,319	26,784	462,366	24,436
Belgian	170,577	624	164,791	244
Brazilian	134,568	23,556	138,347	24,920
Chilian	72,149	41,019	62,376	37,588
Chinese	59,731	573	29,176	573
Colombian	877	934	877	934
Cuban	35,752	1,875	34,958	1,907
Danish	440,010	98,483	410,468	97,726
Dutch	555,047	57,873	515,530	62,579
French	1,104,893	415,029	1,068,036	338,847
German	2,636,338	502,230	2,417,410	488,372
Greek	287,986	55,171	231,541	60,519
Haytian	1,750	...	1,750	244
Italian	691,841	467,241	657,981	459,557
Japanese	555,230	135,351	524,125	120,539
Mexican	15,347	3,303	16,190	3,427
Montenegrin	1,857	4,238	1,857	3,790
Norwegian	866,754	766,003	810,335	816,885
Peruvian	4,992	9,704	4,869	9,704
Philippine Islands	38,284	8,361	32,650	8,264
Portuguese	56,619	49,330	56,036	51,694
Roumanian	17,419	634	17,243	874
Russian	556,102	244,232	533,029	256,224
Sarawak	2,270	...	818	...
Siamese	1,829	294	982	294
Spanish	736,209	48,364	734,557	51,798
Swedish	464,705	225,468	451,020	225,199
Turkish	98,044	61,653	93,233	54,076
Uruguyan	23,961	16,684	10,468	10,819
Venezuelan	4,015	1,060	4,015	1,185
Zanzibar	2,808	...	2,808	...
Other countries	18,740	5,947	17,185	9,425
Total	25,859,987	6,577,776	24,008,883	6,591,627

Of the steamers of from 5,000 to 6,999 tons gross in existence, 347 are owned in Britain, against 302 a year ago; thirty in the United States, against twenty-seven; twenty-one in France, against fifteen; fifty-two in Germany, against forty-five. Of vessels of from 7,000 to 9,999 tons, 109 are owned in Britain, three in the United States, four in France and twelve in Germany. Of vessels of over 10,000 tons, forty are owned in Britain, six in the United States, two in France and twenty-six in Germany.

A Philadelphia dispatch says that it is the opinion of the bankers of that city that the United States Steel Corporation will issue a second mortgage unless it desires to stop the dividends on the common stock. A number of improvements are to be made that will require the expenditure of a large sum of money. One of the Philadelphia bankers says: "My information is that the Steel Corporation management will not undertake to make the proposed improvements out of earnings. To do so would really mean that dividends on the common stock would have to be stopped, and they do not want to disturb the present rate of dividends. While it has not been positively determined, it is extremely likely that a second mortgage, securing a new issue of \$50,000,000 bonds, will be created. The corporation has orders for 1,500,000 tons of steel rails of a certain standard size on its books, besides other rail orders. The total tonnage of all its products now contracted for is sufficient to keep the company busy into the fall of 1903."

A trial was made last week of the new British turbine destroyer Velox. She maintained a mean speed of 33.12 knots per hour.

A BRITISH WARNING.

(O. Elitzbaecher in the Contemporary Review.)

So far most writers on the American shipping trusts, both in the United States and in this country, have lost themselves in speculation and conjecture as to what the shipping trust is going to do, and have mapped out startling programs for its future performance, for the benefit of Mr. Morgan. But as yet no competent writer has looked closely into the business side of the scheme nor investigated whether it is commercially sound and will pay its way or whether it will go to ignominious ruin.

Napoleons of finance can command the abject obedience of the multitude which is required for the execution of their huge schemes only by over-exciting the imagination of the masses and by creating for themselves the nimbus of financial infallibility and omnipotence. And when they have once secured the blind obedience of the crowd they carry also with them the thinking business men who wish to be "in the swim," and who are too experienced to try vainly to go against the irresistible current of a powerful popular movement. Through the foolish they have ruled the wise. They have mesmerized their followers into the hallucination that they command success. Consequently they have been blindly trusted and followed by eager crowds of dupes, as the rats followed the pied piper. But Napoleons of finance are apt to get intoxicated by their successes, and to talk themselves into a belief in their financial omnipotence. Might not Mr. J. P. Morgan provoke a similar fate? Might not the failure of one of his colossal schemes bring about the downfall of all the rest, and with it the greatest financial crash the world has ever seen? May it not be that in spite of Mr. Morgan's largely advertised royal gifts and more than royal art purchases, his financial position is not so unassailable as it is supposed to be? Supposing the shipping trust to miscarry, owing to a counter combination, perhaps assisted by the British colonial governments, being organized to fight it, what would be the consequences?

Apart from these possibilities, think of those numerous immense enterprises all controlled by one man, remember that that one man rules those mammoth concerns merely by his powerful personality, remember that he is a mortal man sixty-five years old, and then contemplate what might happen to the unwieldy combines which he controls if he should die, when the keystone might be taken out of the immense over-weighted arch, when the carefully balanced community of interests might be disturbed by the removal of the pivot, and when the disciplined and carefully harmonized forces might clash and be no more restrainable by a master's hand. Besides, will the prosperity of the United States continue in ever-increasing leaps and bounds as during the last few years, or will the crash and consequent depression which usually follow a great industrial and financial boom come, and how will those huge combinations with their enormous capital weather adversity?

Whether the American shipping trust will be a success or whether it will be a failure, and what, in the event of its being a failure, the consequences to the Morgan enterprises, to the American stock markets, to the markets of the world, to the American public, to American politics, will be, is incalculable. So much is sure, the shipping trust with its unparalleled audacity and boundless ambitions is pregnant with highly dramatic possibilities and is highly vulnerable. Therefore, if the British and Canadian governments are going to strike at the shipping trust, let them strike at once and let them strike hard. The facts of the case are not merely that an American corporation has acquired 4 per cent. of British tonnage, as the Times and our official apologists have assured us, but that America has scooped off the ocean the very cream of our merchant fleet.

A certain consolation for Great Britain lies in the fact that America acquired our best shipping at enormously inflated prices, and the question suggests itself: If American financiers wanted to capture the Atlantic trade, why did they not choose a more economical way, and have new ships built at half the cost per ton at which they acquired the existing lines? Why did they not force the price of the British lines down at comparatively small expense by taking to rate-cutting? The fact that British tonnage was bought at fully double its value is, on the face of it, unsound business, and there lies the extreme danger to the trust. The feverish hurry of the Americans to acquire ships regardless of cost, when they might have been bought and built gradually at reasonable prices, without creating a panic in shipping circles and without provoking this country and Canada into a government-assisted fight for the Atlantic trade, is only explicable in two ways. Either the Morgan clique has made a gigantic, fantastic and impossible speculation, designed only to dazzle the multitude and to secure promoters' profit—which may cause its downfall should it miscarry, and especially should the British and Canadian governments seriously assist our shipping—or the Americans are so confident that British ships in American hands are worth double the money which they are worth in British hands that they do not mind the price. The latter may be possible, though it seems unlikely, not because the Americans are abler ship owners—for that there is so far no proof—but because the American railways, which are at the same time the dock proprietors at the seaboard, may choose to discriminate against British ships, so that the lower rates of British shipping, made possible by their lower cost, would be of no avail. Or the American legislature might conceivably be induced to equalize matters by enabling the trust, by means of subsidies and discriminating charges, to keep cheap British tonnage out of the Atlantic.

If we consider the inflated cost at which the trust ships were acquired, and the still more hugely inflated capital of the trust itself, it becomes quite clear that the trust cannot live on cheap rates. If, nevertheless, by the use of either stratagem the Atlantic trade should for any length of time get into the hands of the trust, it would mean that freights and passenger rates would be put up against Great Britain as long as the trust could rule the Atlantic, and that the food and raw material supplied by the United States to Great Britain, such as cotton, would permanently and materially be enhanced in price. It would mean not only that the United States government would levy import duties on our manufactures, but that powerful American corporations would band themselves together to levy export duties on the raw material required in the making of our manufactured goods. Under the pressure of such a policy our national expenses would grow and our income shrink. Whether under such circumstances British politicians will be allowed to continue to preach the comfortable doctrine of free trade and non-interference remains to be seen. Our ideas on free trade require reconsideration. The time when free trade was understood and intelligently discussed lies too far back. Besides, since then, the conditions of the world have altered. Free trade has be-

come a hazy superstition with the masses, and, unfortunately too, with many politicians, especially with those who are out of touch with the business community. It is, of course, quite clear that if we drive up the workingman's living expenses 25 per cent. by clumsy protection, wages will also rise 25 per cent., and the largely increased cost of production will prevent us from competing successfully in the markets of the world. But it is not less clear that if our trade is ruined by leaving it at the mercy of foreign countries, which strike at it with customs and bounties, and swamp us with their surplus produce under cost price, even the cheapest imports will be too dear for our impoverished and unoccupied workingmen. That intelligent protection of trade and industry is by no means synonymous with trade restriction or harm to the consumer may be seen by the wonderful progress of those protectionist countries par excellence, America and Germany, and no better testimony in its favor could be adduced than that of Mr. Schwab, the gifted manager of the United States Steel Corporation. When asked in an official inquiry: "Do you think the tariff policy of this country for the past four years is the reason of our great wealth?" he replied: "Undoubtedly. I know of no other reason so important." Free traders might compare this statement with Mr. Gladstone's ancient dictum that America's tariff was the insurmountable obstacle to her commercial success.

Owing to the rule of free trade doctrines, we are neither free to trade with other nations on a basis of equality, nor even free to utilize our own resources—except at the tolerance of foreign nations. Consequently many of our manufacturers have taken their machines, staff, workmen and business connections bodily over to foreign countries, and enriched them with their industry, or have shut up shop, or have turned with the resourcefulness of the race to those other industries which the foreigner allows them for the time to follow without molestation. So far hostile tariffs and bounties have wrought their evil consequences upon our industries very gradually, and consequently the havoc done to them has attracted comparatively little notice. But the dramatic suddenness with which the cream of our Atlantic shipping trade has been wiped out of existence and the threat which lies in the shipping trust suddenly to increase the price of our food and raw material are bound to stir up the nation, and to open the eyes even of the most self-complacent and infatuated free trader. Great Britain is getting a lesson. It will be probably a very expensive lesson, and consequently it will be taken to heart.

The economic renaissance of Great Britain must needs be gradual, and there are already many signs that the tide is turning. The importance of the application of science to industry is being generally recognized; technical education is spreading fast; and charitable bequests are more and more—though not by any means sufficiently often—displaced by bequests for educational purposes. Our manufacturers are discovering that their shops are full of antiquated machinery; they are replacing their out-of-date plant everywhere with the newest and most perfect, and our engineering firms are vigorously going in for standardization. Our railways are waking up to the fact that they are shockingly behind the times, and that they throttle trade with their high rates, and our railway managers have run over to the United States to learn from American experience. Directors of industrial companies are finding out that it is foolish to distribute all their earnings, and are beginning to allow amply for renewals, and to create substantial reserves. The leaders of the trades unions and the men themselves are discovering that restriction of output is a suicidal policy. The public has become sick of losing its money in wildcat schemes and is turning away from bogus flotations. It rebels against incompetent or fraudulent directors, and the promoters, who will always float what "will go," find out that solid enterprises are "going," and they get "stuck" with unsound schemes. The politicians also see that the tide is turning, and are more and more strongly advocating efficiency and business-like government, and feel less inclined than formerly to rely on a plausible "cry" like free trade. They are recognizing that free trade is coming up for trial, and our government begins to show fight against the iniquitous continental sugar bounties. Also the emigration of our citizens and of our industries is no more viewed with the former unconcern. In fact, the whole nation is putting its shoulder to the wheel, bent on the furtherance of economic efficiency.

Two important factors are, however, as yet insufficiently recognized, though they will probably be hammered in by the American shipping trust, and by the other trusts which are attacking British industries. These factors are:

1. The supreme importance of combination in business, and the necessity of bringing conflicting interests into line by insisting on the community of interests.
2. The impossibility of private enterprise to stand up against the powerful state-aided industries.

Englishmen have been so long accustomed to look after themselves, that they have become constitutionally disinclined to combine for business. As yet trusts and powerful combines are viewed with vague distrust, and are commonly either considered as mere promoters' inventions, designed to enrich a few financiers and then to collapse, or are institutions solely planned to create a monopoly, and to extort from the public the highest price for inferior articles. No doubt many trusts have been launched for such objectionable purposes; but the trust in its highest form is simply a superior phase in the organization of industry; it is a machine designed to facilitate work, to simplify business, to diminish friction, to improve manufacture, to buy collectively at the cheapest, to replace a host of intruding middlemen and of competing shipping agents, carriers, commercial travelers, auditors, lawyers, banks, etc., and to regulate the giving of credit.

When looked at with an unbiased mind, properly constituted trusts are seen to serve to cheapen production, facilitate distribution, increase consumption, and thereby create more wealth and greater comfort and happiness for the masses. Trusts which try to maintain monopoly prices are creating competition and digging their own graves. Trusts can only subsist if they strive for cheapness and excellence. The great economic labor-saving advantages of properly constituted trusts are clear; but even the largest combination of industry under the most capable guidance is unable to stand up against a powerful state-aided industry. The decay of the West Indian sugar industry under the bounty system is a case in point. So far the attacks made by foreign tariffs and bounties have been chiefly directed against the creation of manufactured goods; but there is no reason why foreign countries or foreign state-aided corporations should not attack the raising of raw

produce in our colonies. Attacks might for instance be made upon Canadian grain and cattle raising, Australian wool growing, etc., and in all probability they will be made, unless the empire stands united in trade as it has stood in war, ready to retaliate for every attack on its business.

To us the trusts will convey the lesson that not only greater efficiency in business and greater individual efforts are required, but that the whole world is becoming like one country, and that not only trade and industries, but talent of every kind will go to that state where it has the greatest chance, where it is best paid, best protected and least molested. To America the trusts may convey a different lesson. The idea underlying trusts is excellent, and trusts, when properly constituted and managed, are bound to be highly successful and beneficial; but the best idea may be hunted to death. Intoxicated by their successes American financiers have converted into trusts suitable and also quite unsuitable industries, and have capitalized them at exaggerated prices. The reaction will not fail to come, and it may come soon. Happily the British public will only be affected indirectly when the inevitable smash comes, as most trust securities are unknown in this country. Posterity will perhaps compare Mr. J. P. Morgan with John Law. John Law recognized in paper the currency of the future, and in driving this excellent idea too far brought France and himself to ruin. Mr. J. P. Morgan has recognized the trust as the industrial organization of the future, but he may, by driving his idea too far, and by trying to conquer the whole world for his trusts, ruin the United States.

PACIFIC MAIL'S BAD YEAR.

At a meeting of the Pacific Mail Steamship Co.'s directors, held in New York last week, Mr. Charles H. Tweed resigned from the presidency and E. H. Harriman was elected to succeed him. A majority of the Pacific Mail stock is owned by the Southern Pacific Railway Co., of which Mr. Harriman is the head, so that the change in the management of the steamship company is merely formal and the policy of the company will not be affected. Mr. Tweed has been president of the company since the death of Collis P. Huntington. The company's annual statement was unfavorable, showing on its balance sheet an increase of \$384,802 in its debt to the Southern Pacific for new steamers. Its income account is also unfavorable, showing a decrease of \$1,041,819 in the year's revenue, against decrease of only \$566,063 in expenditure. There is a deficit of \$307,935. President Tweed in his annual report to the stockholders speaks of the deficit as follows:

"This unfavorable showing is largely the result of the low rates which prevailed during the entire year to and from the Mexican and Central American ports, which in part resulted from the suspension of former traffic relations with the Panama Railroad Co., which since the close of the fiscal year have been resumed. The rates to said Mexican and Central American ports had fallen to a point where it was deemed advisable to reduce the service, and but seventy-three trips were made on these lines during the year just ended, against 115 trips during the preceding year. There were also six trips less of the trans-Pacific lines, which fact contributed to the shrinkage in the year's receipts.

"The steamship San Blas, wrecked in December, 1901, proved a total loss. The difference (amounting to \$193,177) between the cost of the steamer as charged on the books of the company (less depreciation) and the amount credited against such cost for insurance received, was charged to 'profit and loss.' The expenditures for repairs while the steamers are in service and included in 'steamer expenses' amounted to \$91,141. After charging the fund for depreciation and general extraordinary repairs of steamers and other floating equipment with \$63,099 for actual expenditures chargeable to this account, and with \$54,542 for depreciation chargeable against the steamship San Blas, there remains to the credit of this fund at the close of the year \$772,728. For account of the two new steamships Korea and Siberia, the company paid during the year \$498,000, representing all payments which became due under the contract, and making total payments on account of these steamers \$2,871,772."

President Tweed says that with the exception of the indebtedness amounting to \$634,804, representing amounts borrowed from the Southern Pacific Co. to make payments on the new steamers, the company is free from floating debt, other than current expenses. The financial statement follows:

RECEIPTS.

	1902.	1901.	1900.
Gross earnings, steamers	\$1,883,413	\$2,868,969	\$3,609,840
Central American governments for mail service	8,640	13,878	12,282
Miscellaneous collections at agencies	121,857	158,555	150,673
Interest	15,436	29,763	44,825
Total receipts	\$2,029,346	\$3,071,165	\$3,817,620

EXPENSES.

	1902.	1901.	1900.
Expenses of steamers	\$1,590,990	\$1,878,445	\$1,958,466
Repairs	324,782	345,168	349,380
Agency expenses	280,059	527,463	534,684
General expenses	122,208	152,269	131,430
Interest on loans	19,243	13,471
Total expenses	\$2,337,282	\$2,903,345	\$2,987,431
Expenses over receipts	307,935	sur. 167,820	sur. *230,189

*After dividends of \$600,000.

GENERAL BALANCE SHEET AS OF APRIL 30.

	1902	1901	
Assets:			
Steamers	\$5,972,900	\$6,271,337	Dec. \$298,437
Steamers building	2,871,772	2,325,400	Inc. 546,372
Other floating equipment	323,564	324,667	Dec. 1,103
Real and other property	627,688	665,596	Dec. 37,908
Current assets	732,049	745,231	Dec. 13,182
Due from Central American governments	17,670	19,170	Dec. 1,500
Deferred accounts	967	20,141	Dec. 19,174
Contingent assets	119,432	Dec. 119,432
Expenses liabilities	11,046,834	10,615,686	Inc. 431,148
Total	\$21,593,444	\$21,106,660	Inc. \$486,784
Liabilities:			
Capital stock	\$20,000,000	\$20,000,000	
Loans	634,804	250,000	Inc. \$384,804
Current liabilities	152,050	182,885	Dec. 30,835
Deferred liabilities	8,910	33,428	Dec. 24,518
Depreciations and repairs	772,721	565,580	Inc. 207,141
Unadjusted accounts	24,959	74,767	Dec. 49,808
Total	\$21,593,444	\$21,106,660	Inc. \$486,784

NAVAL STRENGTH OF NATIONS.

The navy department has just received information regarding the relative strength of naval powers, which puts Great Britain easily in the lead with more tonnage than any two naval powers combined, and, with the small fleet of Japan added, would have a more effective fighting strength than any three powers. This comparison is based on the ships completed and under construction. The United States' position, according to foreign estimates, should now be as near France as that of either Germany or Russia, both of which have made great strides in late years in naval expansion. What each government is doing towards increasing her navy is given in official records as follows:

France's program of increase is second to that of Great Britain. France probably will continue to be the second mistress of the seas for many years, although, according to Lord Brassey, she is not making such an advance as her position calls for. At present she has building three battleships, each of 14,865 tons displacement, and three of the same type of more than 12,000 tons displacement. Her power, however, lies in her armored cruisers, of which class she has under construction a number almost equalling that of Great Britain. Five of this class are of 12,550 tons, one of more than 11,000 tons, five of 10,014 tons and six ranging down to 7,700 tons. She has also two protected cruisers under construction, twenty-four destroyers of 303 tons each and about fifty other torpedo-boat craft of less than 100 tons. The French program contemplates that thirty-seven vessels will be laid during the present year. These are to be four battleships of 14,865 tons each; two armored cruisers, each of 12,550 tons; two destroyers, each of 303 tons; sixteen first-class torpedo boats and thirteen submarine boats. At the end of the present year there will be under construction in all for the French navy 118 vessels.

Germany is following a program of increase agreed on some years ago and designed to place her ahead of Russia and the United States in amount of tonnage. Her fighting ships now building comprise four 13,000-ton battleships, five 11,500-ton vessels of the same class and two of 11,130 tons, four armored cruisers of heavy displacement, and a dozen protected cruisers also being a part of her increase plan. Germany is also building a number of gunboats and torpedo-boat craft. Her navy has made very rapid progress and is creating a large means for future extension. The emperor seems to be accomplishing his purpose to lift his country to a notable place among the maritime powers.

When it comes to Great Britain's stupendous plan of naval increase that of all other nations looks small in comparison. To maintain a naval force equal to that of any other two naval nations combined Great Britain is forced to expend millions of pounds sterling annually on new ships. Three battleships of 16,500 tons, five of 15,000 tons and six of 14,000 tons comprise her great fleet of battleships now under construction. Of the armored-cruiser class she is building twenty-four, ranging from 14,100 tons displacement down to 9,800 tons. These vessels are of the highest type. Of the protected cruiser class she is building only six, and of the gunboat class a score or more, while her torpedo-boat increase is limited to half a dozen and her submarine boats to about the same number.

After many years of inactivity Italy has begun to revive her naval efficiency and has now building seven first-class battleships. She is also building a large armored cruiser and a number of other classes of war vessels.

Japan's navy is growing rapidly and includes now under construction a first-class battleship and a large number of cruisers and torpedo-boat craft. A new program of expansion recently agreed on provides for four battleships of 15,000 tons each and two armored cruisers of 9,900 tons each and a number of smaller cruisers.

Russia is building five 12,000-ton battleships, five of 13,516 tons and seven varying from 12,000 tons to 5,000 tons. In addition there are thirty cruisers under construction and a number of miscellaneous vessels, including a large fleet of torpedo boats.

Spain is beginning to show signs of some naval activity. It has been recommended by a special board that provision should be made for laying the keels of twelve battleships, four armored cruisers and a number of other ships. Some of her ships now building have been on the ways for more than ten years and are yet far from completed.

What the other governments are doing toward their naval strength is insignificant, compared to the strides that the leading powers are making, although there is no nation with a seacoast making any pretense to supporting a naval establishment that is not building some type of war craft.

Argentina's naval increase proposed, but not yet ordered, consists of two armored cruisers of 8,500 tons.

Austria proposes expending on her navy this year \$9,474,000, which does not include payments on vessels now building. These consist of two battleships of 10,600 tons each, three of 8,340 tons and an armored cruiser of 7,400 tons, a protected cruiser of 2,350 tons and some small river boats. She is adding also to her naval equipment by the construction of a 15,000-ton floating dry dock, which is to be built at Pola.

Brazil is devoting some attention to the question of the submarine boat, but, aside from this class, is making no provision for ships.

Chile, the most progressive naval nation in South America, has ordered two battleships to be constructed in England, each to cost, armed and equipped, about \$5,000,000. They are to be powerful craft and will have engines to develop 25,000 horse power and capable of 21 knots. Each ship is to carry four 10-in. guns, 15 7.5-in. guns and many smaller rapid-fire guns.

Even Mexico is building a navy.

The old target ship Belle Isle was once more knocked almost to bits by the modern guns of British warships last week. The lords of the admiralty and many high naval officials witnessed the experiments, which consisted of several hours' firing with 9-in. and 6-in. guns loaded with lyddite. The Belle Isle's bridge was blown up and her deck was swept clear of its superstructure. The shells which burst inboard raised clouds of fragments and splinters. The Belle Isle was moored in a favorable position, and had been carefully armored with modern plates. Every precaution had been taken to prevent the results from becoming known, and in a few days the Belle Isle will be torpedoed.

The net profits of the New York Ship Building Co., Camden, N. J., for the year ending June 30 are announced as \$1,500,000.

NAVIGATION IN THE ST. LAWRENCE GULF.

Owing to the numerous fogs, the often unfavorable ice conditions and the steep, rocky coasts in the Gulf of St. Lawrence, these land-encircled waters are fraught with many dangers to navigation. The fact may not be generally known that marine insurance companies charge a rather higher rate of premium on freight and vessels that must cross the Gulf of St. Lawrence than is usual along other parts of the Atlantic coast. There are three routes between the St. Lawrence river ports and the open waters of the Atlantic, and the two which figure most largely in the European trade have a bad reputation. The Canadian government is now trying to mitigate the dangers that beset both of these highways to the ocean. The shorter of these routes is the passage between the gulf and the ocean through the Strait of Belle Isle, which separates the Labrador coast from the long peninsula that forms the northwestern part of Newfoundland. It is popular among shipmasters only because it is the shorter route between the coasts of Great Britain and the ports of the St. Lawrence river. In fact, the shortest route between Liverpool and Asia is along this route. The distance from the Strait of Belle Isle, where steamers from the Atlantic enter the coastal waters, to the head of navigation in Lake Superior is 2,384 miles, the gulf, the St. Lawrence and other rivers, the lakes and canals affording an unbroken waterway. The dangers of this great highway into the heart of Canada are almost wholly concentrated in the Strait of Belle Isle and the Gulf of St. Lawrence. Unfortunately for navigation, a branch of the polar current enters the strait in the spring and summer, delaying navigation in the strait until July. Not only the polar current, but also tidal currents enter the gulf, bringing with them enormous quantities of drift ice of every conceivable size and form, which are scattered over the gulf from Labrador to the estuary of the St. Lawrence river. This drift ice from the sea mingles with the great masses of ice which the St. Lawrence pours into the gulf during the spring floods. The fog banks that hang over the gulf during a part of the season are due to these ice fields, and the impediment to navigation is intensified by the shifting currents. It would be impossible during a large part of the navigable season to utilize the route through the Strait of Belle Isle if it were not for the alarm guns and fog signals that are almost constantly raising a din along the shore.

Five excellent lighthouses are in service along the dangerous shores of the strait, and the Canadian government has recently completed a new improvement that is most joyfully welcomed by navigators. It has opened the first telegraph station in this region. The station has been built on the southeast side of Forteau Bay, at the narrowest part of the Strait of Belle Isle and on that portion of the coast of Labrador which belongs to Newfoundland. Daily reports will in future be sent to Quebec and Montreal as to the ice, fog and wind conditions in the Strait of Belle Isle and the northern, narrow part of the Gulf of St. Lawrence. It is expected by navigators that this daily report will considerably lessen the dangers of navigation in these parts of the coastal waters.

The second route to the Atlantic, along the southern coast of Newfoundland, is marked to a large extent by the same difficulties and dangers which are only partly obviated by the fact that the Canadian government maintains lighthouses at Cape Ray and Cape Race, respectively the most western and most eastern points on this route along the Newfoundland coast; while Newfoundland has lighthouses at Channel Head, Cape St. Mary, Cape Pine and other points. But this high and rocky coast, with its numerous projections into the sea and its prevalent fogs, is by no means adequately provided with lighthouses and signal stations, and it is now the purpose of the Canadian government to remedy the deficiency to a considerable extent in view of the importance of the route and the growing trade with Europe.

Politically, Newfoundland is wholly independent of Canada, but the force of the reasons urged by her government, whose treasury is never in a very flourishing condition, why Canada should bear the larger part of the expense of facilitating navigation along her southern coast is fully recognized by the Canadian authorities. The taxpayers and officials of Newfoundland say that nine-tenths of the advantage to be derived from the improvement of the southern route to Europe will accrue to Canada, the commercial interests of Newfoundland being but a bagatelle as compared with those of the Dominion; Canada, besides, is comparatively rich, while Newfoundland is not in affluent circumstances; for these reasons, it is their opinion that if a great deal of money must be spent to improve navigation along their south coast, the larger part of it should come out of Canada's strong box.

Canada does not dissent from this view, though she insists that Newfoundland should justly bear a considerable proportion of the cost of essential improvements. The first step will be to build a lighthouse in the extreme southwestern part of St. Mary's bay, the scene of not a few tragedies of the sea, where, owing to the difficulties of the position and the necessity of providing a first-class equipment throughout, the cost will be very large. Canada will bear the lion's share of it.

The third route between the Gulf of St. Lawrence and the Atlantic is the Strait of Gut of Canso, the deep, narrow lane of water which separates the peninsula of Nova Scotia from Cape Breton Island. It is available for the largest ships, and, though only three-quarters of a mile wide at its narrowest point, no part of it is less than ninety feet deep. It is not so conveniently situated, however, for vessels in the European trade as the other routes, and its greatest value is as a passageway for ships in the coasting trade.

BRITISH EXPORTS OF COAL.

The aggregate exports of coal from the United Kingdom in the first half of this year were 20,865,973 tons, compared with 20,970,197 tons in the first half of 1901 and 22,063,206 tons in the first half of 1900. The principal exports were:

Country.	1902. Tons.	1901. Tons.	1900. Tons.
Sweden and Norway	1,808,331	1,776,364	2,032,942
Germany	2,611,246	2,681,199	2,704,757
France	3,561,329	3,986,603	4,230,783
Spain	1,372,200	1,418,288	1,315,792
Italy	3,035,004	2,687,463	2,625,913

The official trial trip of the monitor *Arkansas*, built by the Newport News Ship Building & Dry Dock Co., will occur Aug. 6.

THE PRESIDENT'S YACHT MAYFLOWER.

The Mayflower, which has been designated as the president's official yacht, is now as sumptuous as any craft afloat. The president's quarters are situated aft, on the main deck, and include six staterooms for the exclusive use of himself, Mrs. Roosevelt and their children. The two largest of these staterooms have been very lavishly furnished. Special attention has been given to the decoration of the bulkheads and the paneling, which are covered with expensive silk in many colors. On the spar deck forward are the chart house and the staterooms of the surgeon and paymaster. These are fitted up in simple but expensive style. The smoking room occupies the after portion of this deck and is finished in teak, with a floor of fancy woods, inlaid with mosaic, and waxed. Many cane chairs and sofas add to the comfort to be had in this room. Below on the main deck the captain's cabin, stateroom, and bath-room occupy the forward part of the port side, the similar section starboard being used as a ward-room and containing quarters for the executive and other officers of the ship. Behind the officers' quarters is the president's dining saloon. It extends the width of the ship and is furnished in white and gold, Louis XIV style. The bulkheads are beautiful with delicate tracery, and light is admitted through two spacious skylights, mahogany rimmed. A handsome Italian marble mantel ornaments the forward bulkhead, above which is a large oval mirror framed in gold. Running aft from the dining room is the companionway to the president's reception room. Some of the panels along this companionway are made of Valenciennes lace, painted over with silver paint to represent steel. The metallic pigment on the threads of lace so stiffens it that if the lace be touched sharply with the finger it gives out a sound like a silver bell. In the reception room the white and gold effect is still carried out. This room is furnished also in white and gold, the prevailing scheme in decoration. The library adjoining the reception room is finished in Flemish oak and the book shelves are fitted into the bulkheads.

Leading down to the berth deck aft is a magnificent mahogany stairway that gives entrance to the president's private suite. There are two large staterooms, four smaller ones, and two bath-rooms. The larger of the rooms is for the use of President and Mrs. Roosevelt, its companion for the use of Miss Alice Roosevelt, and the smaller ones are for the remaining children of the family. Handsome brass bedsteads and all the dainties of boudoir furniture are to be seen in this part of the ship. On the port side, just outside of the president's room, is his private bath. The tub, which is cut from a solid block of fine marble, is sufficiently large to enable the president to splash around. The fittings and the plumbing in the bath room are of white metal heavily plated with silver. When the Mayflower went out of commission, some months ago, the paneling in the president's staterooms was of decorated linen. During the refitting period this fabric was removed and handsome flowered silk of many colors was put in its place. Besides the arrangements made for the comfort of the president and his family in the living and sleeping apartments aboard, extensive plans were made to give him the benefit of the most improved culinary and sanitary contrivances. There is a large refrigerating plant and a spacious winery in the forward part of the vessel, near the dining saloon. Nothing has been left undone to make the Mayflower a fit habitation for the ruler of a wealthy nation. Before the Spanish-American war the Mayflower was the property of Mrs. Ogden Goelet. It had been built for her husband by G. & J. Thompson, on the Clyde, at a cost of \$800,000. When Mr. Goelet died his widow at one time contemplated selling the yacht to the King of the Belgians. At the outbreak of the war the Mayflower was bought by the United States government for service as a torpedo-boat destroyer at a cost of \$450,000.

The vessel is 321 ft. over all, 275 ft. on the water line, has 36.6 ft. beam, and is of a most graceful type of construction. Her displacement is 2,690 tons, and she has triple-expansion engines of an indicated horsepower of 4,700, that drive her through the water by means of twin screws. She is both speedy and steady in a seaway. After the purchase by the government she was taken to the Brooklyn navy yard and refitted with a complement of 4-in. and 5-in. guns, together with several rapid-fire pieces. For her present use the guns of heavy calibre have been replaced by one and six-pounders. When Gov. Allen was sent to Porto Rico he was given the Mayflower, after she had been outfitted at considerable expense, as his official yacht. The Mayflower, which now replaces the *Dolphin*, is under the command of Lieut. Comdr. Albert Gleaves. The Mayflower is now storing food and naval supplies for her summer sailing, and will be ready in a few days to go wherever the president shall desire.

WIRELESS TELEGRAPHY ON THE GREAT LAKES.

Mr. Daniel Kelley, representing the Marconi Wireless Telegraph Co. of America, has just concluded a tour of the great lakes on behalf of his company. The purpose of his trip was to ascertain whether any field existed on the great lakes for a system of wireless telegraphy. He saw the managers of all the passenger and leading freight lines but received little encouragement. The conditions on the lakes are not favorable to the wireless system, because the vessels are so rarely out of sight of the wire. A cargo boat on a round trip of from eight to twelve days is reported about a dozen times to its owners. He has knowledge of its exact location during the entire trip. It is only when the vessel is on Lake Superior that he is without knowledge of her for more than twenty-four hours. Wireless telegraphy is, therefore, not of practical service to him. With the passenger lines, which have human lives at stake, the situation is somewhat different, though Mr. Kelley did not find it sufficiently acute to warrant any of them incurring the expense of putting in the apparatus. The apparatus costs \$1,500 a year, if bought outright, and \$700 a year if rented, though in either case the living expenses of the operator are to be paid by the ship. His salary will be paid by the Marconi company. The managers of the cargo carriers maintained that the board of one operator alone would be more than they now pay in telegraph tolls to keep track of all their ships. Mr. Schantz of the Detroit & Cleveland Navigation Co. was the one man to whom Mr. Kelley talked who seemed at all enthusiastic. He gave him sufficient encouragement to induce the home office to open negotiations with him for the installation of its system. Mr. Kelley thinks the company may establish a station just west of Cleveland for purposes of demonstration.

STRIKE OF HARBOR TUGMEN ON THE LAKES.

An effort is being made by President D. J. Keefe of the International Longshoremen & Transport Workers' Association to settle the strike of harbor tugmen on the great lakes, which has been on for about four months past. It is hoped that Mr. Keefe will be successful, as great losses have been sustained on both sides of this struggle.

One feature of this strike is of more than local interest. It has been claimed by attorneys of the tug company that certain licensed officers who are on strike have subjected themselves to revocation of license under section 4449 of the United States revised statutes, in that they have, to the hindrance of navigation, wrongfully and unreasonably refused to serve in their official capacities. A settlement of this question will be sought, the attorneys say, whether the strike is settled or not. Proceedings on this score before the local steamboat inspectors at different ports around the lakes were suddenly terminated a few weeks ago by the tug company's attorneys, on account of the refusal of the men on strike to answer questions which it was claimed were pertinent to the inquiry. The men refused to answer questions as to strike orders from President McCaule and other union officials, and were in fact non-committal in all matters that seemed pertinent to the inquiry. It was thought attorneys for the tug company had given up, and that the legal proceedings, which would necessarily be long drawn out, would no longer stand as an obstacle to the settlement of other differences. It appears, however, that the matter has been taken before the treasury department at Washington and the claim set up that if licensed officers simply refuse to answer pertinent questions asked at inquiries before local inspectors on the score that answers to such questions would subject them to penalties of the law, then the inspectors are powerless, their functions fail and the purpose of the law is frustrated. The petition of the tug company to the treasury department dealing with this refusal of licensed officers to answer questions at hearings before the local inspectors is a very lengthy document. Following is a concluding paragraph in it:

"We need hardly say that where collisions occur, neither party to the controversy are at all anxious that the other shall be advised of the testimony of their crews in advance of the litigation which usually results, and so long as the ruling of the department shall stand as it is, it is certain that all proctors will advise their crews when called before the inspectors to simply refuse to answer. This means the abolishment pure and simple of any investigation and the entire loss of a control over licensed officers and the service which it was intended should be reposed in these officers, save only as it relates to the issuance of licenses or the infraction of some regulation or some act of incompetency committed in the immediate presence of the board. It is doubtless true that in some cases the necessary information would be volunteered, but the fact remains that a tribunal which must depend upon information being volunteered could in no measure exercise the remedial control over the service which it was intended it should have. It is neither reasonable nor just that such condition should obtain in the service."

TO SELL THE REPUBLIC MINE.

Directors of the Republic Iron Co., which operates the Republic mine on the Marquette range, have received overtures from the Cambria Steel Co. for the purchase of the property. The Republic mine is one of the oldest mines in the Lake Superior region. It was discovered contemporary with the Jackson and Cleveland mines, but owing to the lack of railroad facilities no attempt was made at development until long after the Jackson and Cleveland mines were in operation. Altogether since its opening 5,014,855 tons have been won from it. The ore is a hard Bessemer. Not many years ago it was the first of the Lake Superior ores to find a market. Officials of the company had simply to fix the price and the product of the mine was taken at once by different furnace owners, who made Republic the basis of their purchases. Through all the combinations of late years the Republic company has stood out alone as an independent concern. The result has been difficulty in disposing of the ore. The sale would undoubtedly prove advantageous to stockholders, even if the Cambria company secured barely a control of the stock. If the Cambria company secures a control the ore will very probably be handled through M. A. Hanna & Co. of Cleveland, who look after other ore shipping interests of the Cambria company.

Directors of the Republic company have put a price of \$15 upon the shares and have approached the stockholders with a circular to sell upon that basis. This would mean \$1,500,000 as the shares number 100,000. A number of the directors and stockholders, including G. W. R. Mattison, Samuel Mather, J. V. Painter, A. Hart, W. F. Dummer, N. M. Kaufman, William D. Rees, W. B. Castle, J. C. Gilchrist and Jacob Perkins, have consented to dispose of their stock upon that basis. They have deposited their certificates with Mr. W. D. Rees, the treasurer of the company, who will receive the certificates of all other stockholders who desire to sell. The Cambria Steel Co. will be satisfied with a controlling interest, though it is understood it will purchase all of the stock if it is possible to obtain it. The Republic Iron Co. also owns the steel steamer Republic, the wooden steamer Continental and the schooner Grace Holland.

PITTSBURG'S SUPREMACY IN IRON MAKING.

The Washington correspondent of the Boston Evening Transcript sends a letter to his paper to the effect that the railroads have conspired to retain the supremacy of Pittsburgh as an iron making center. Pittsburgh, as is very well known by those who have studied the subject, is not the logical place for the making of iron and steel today. All things considered steel can be made cheaper elsewhere. When Pittsburgh began its career of iron making it possessed the advantage of the confluence of two navigable rivers; and the waterways at that time were the chief methods of transportation. The railway was in its infancy. The cost of assembly and distribution were lower at Pittsburgh than at any other given point. Such is not the case today. The materials out of which steel are made could be assembled at any point on the south shore of Lake Erie cheaper than they could be at Pittsburgh. If there were no iron mills in Pittsburgh today none would be located there; but as the investment in manufacturing plants there is so enormous it is held to be cheaper to maintain them than to dismantle and build them elsewhere. The situation at Pittsburgh is artificial and can only be maintained by arti-

ficial means. Following is what the Transcript man writes. The information may be incorrect, but his reasoning is very good:

"If railroad rumors which have reached this city are true, Pittsburgh, one of the most thriving and rapidly growing cities on the American continent, is holding its place on the industrial map by the fiat of the great railroad managers. Upon their decree its future rests. It seems that when Mr. Cassatt came into control of the Pennsylvania system he determined to put a stop to all secret and preferential rates, and to apply an equal tariff to all shippers. He learned, so the story goes, that Mr. Carnegie had for a long time been receiving a confidential rate which was materially less than the published schedule. An interview between the two men followed at which it is said that Mr. Carnegie convinced President Cassatt that the products affected by the rates in question could not be profitably manufactured in Pittsburgh if the published schedule of the Pennsylvania railroad were to be adhered to. At all events the rates were materially reduced on iron and steel and their products from the Pittsburgh region to all eastern points. This was notable and occasioned surprise at a time when the principal lines within Chicago and New York city had begun to do business upon such terms of friendly interest that they did not compete with each other as in the days before the present era of railroad combination. This action of the roads has lent some plausibility to the report of the interview between Mr. Carnegie and Mr. Cassatt.

"Pittsburgh evidently needed the reduction in rates if it was to hold its place as a manufacturing centre. The main energy of the modern business is now directed toward the search for economies. Under these conditions the far-seeing business man is impatient of any waste of effort. It may be set down as a rule that the ideal place for the manufacture of any article, so far as transportation is concerned, is where the raw materials can be assembled and the manufactured product sent to its great markets at the least aggregate cost. In the iron and steel industry that point is not Pittsburgh. In theory, at least, Cleveland or some other city on the great lakes would approximate ideal conditions of coal and ore transportation.

"The enormous industries in which Pittsburgh leads are dependent upon the heavy and low-class raw materials; the freight charge on them is a very important matter. While nominally the ores of the Lake Superior region are sent to meet the coal at Pittsburgh, in point of fact most of the coal, or rather the coke, used in the Pittsburgh furnaces is shipped by rail to that city from points in the region of which it is the center. Connellsville, 60 miles away, is the real center of the coking region. Since coke and the ores each have to be carried on the cars for some distance the question arises whether the meeting-place could not be best made where the water haul of the ore ends, or at some point on the great lakes? Then the coke, once loaded on the cars at Connellsville, or towns of which it is a type, would be carried on right through Pittsburgh to the lakes; the difference in cost between the length of the old haul and the new would be comparatively slight. Loading and unloading is the important factor. All the water-borne ore which comes down from the Lake Superior region must now be loaded on the cars and sent by rail over to Pittsburgh. Cleveland or some point on the great lakes should seemingly then be the iron and steel center of the United States. But Mr. Cassatt, with his rare sagacity and breadth of view, saw that the future prosperity of the Pennsylvania railroad system depended greatly upon the maintenance of Pittsburgh and the extension of the vast manufacturing industries of that region. The Pennsylvania railroad could not afford to have any northern competitor of that region or to have another Pittsburgh established on Lake Erie. So as a matter of railway policy, to preserve the supremacy of Pittsburgh as a manufacturing center, to protect the establishments already in operation there, and to invite others, the railroads proposed to make a rate which would hold business at that point. They did so. Pittsburgh has thus been decreed the capital of the iron and steel industry by the railroad interests of America. This is what the substantial reduction in rates at a time when reductions were not generally in order really signified."

IRON AND STEEL CONSUMPTION STILL GROWING.

Until pig iron is more plentiful steel makers are not likely to meet the views of buyers who are holding off for considerably lower prices on contract steel. The enormous production of pig iron in the first half of the year—8,808,574 gross tons—with unsold stocks on June 30 reduced to 29,861 tons, against 372,560 tons a year previous, gives some measure of a still growing consumption. And the impression is heightened by the figures for pig iron imports which have now reached 2,000 tons a day. Foundries pressed for iron are taking small lots of Scotch pig iron at \$25 to \$26 delivered in the central west, and import iron has gone as far west as the Chicago district. The southern furnaces have made sales for next year at \$17 Birmingham for No. 2, following earlier sales at \$16.50 and some are disposed to ask \$17.50 and even \$18. The Chicago district reports a large business with prices tending upward for both southern and northern iron. Structural material shows the strongest situation in the entire market. Heavy selling for next year continues, and deliveries before July 1 are now impossible with some mills. Plates are also strong on steady demand. The starting up of two Pennsylvania mills in October is expected to give some relief, though both have booked considerable advance tonnage. Other plate mill capacity is building, to be ready next year.

That there will be a considerable shortage of both pig iron and steel before the end of the year is growing more apparent daily. Furnaces in the Mahoning and Shenango valleys and those in the south, supplying the Pittsburgh district, are by no means catching up on their deliveries; some of them, especially those in the south, get further behind daily. The merchant furnaces in the valleys that supply the Pittsburgh district with a large tonnage of Bessemer are from one to three months behind, while deliveries on foundry iron are in arrears from one to two months. Unless conditions grow more favorable during the next few months enabling the furnaces to produce at least their normal output the shortage will grow more pronounced. And if this proves to be the case both foundries and steel plants will be compelled to shut down at periods during the next five months on account of the failure in the supply of iron. Foundry iron for prompt shipment has been making new high record marks of late, and many of the consumers that only a short time ago interested themselves in their supply for next year are confronted with conditions not anticipated for the remainder of this year.—Iron Trade Review.

BRITISH AND AMERICAN COMMERCE.

MR. WHITELAW REID'S SPEECH BEFORE THE AMERICAN CHAMBER OF COMMERCE AT LIVERPOOL—TOUCHES UPON THE SHIPPING COMBINATION—COMMERCIAL SUPREMACY OF LIVERPOOL.

The Review last week published a brief extract from a somewhat remarkable speech which Mr. Whitelaw Reid delivered before the American Chamber of Commerce in Liverpool. The full text of the speech is now at hand. Mr. Reid was the guest of the chamber. His speech was in reply to the introduction accorded him by the Earl of Derby.

"It is a privilege and a great pleasure," Mr. Reid said, "to be able to congratulate this chamber on the celebration of its centenary. Beyond that, far beyond mere congratulations on the happy completion of an active and useful career of 100 years, it is a source of unmixed pride to consider what fruit the trade of the century, shared and in part directed by this body, has borne. I speak only of that to which the American Chamber of Commerce in Liverpool has direct relation when I remind you that the century's work leaves the interchange of commodities between the ports of Liverpool and New York, as I am assured, actually the largest that exists anywhere between any two ports in the world. It happens that, in too generous recognition of some small success in the removal of restrictions on our trade, secured in our diplomatic service, I have long been a life member of the New York Chamber of Commerce and am at present one of its vice-presidents. I have some right, therefore, on this auspicious occasion to extend to you, as I now do with all possible sincerity and cordiality, the congratulations of the corresponding body in the metropolis of the new world, on the marvellous record of your past century, and their earnest wishes that throughout the next century the pace you have already set may be more than sustained."

In connection with this congratulation extended to Liverpool on account of commercial progress, Mr. Reid also congratulated the British nation upon the recovery of the king and the return of peace in South Africa. "You are to be congratulated," he said, "that the good omens which greeted the approach of coronation day are already renewed and surpassed. The good omens are wider, too, than South Africa. At this moment peace prevails, for the first time in long years, over practically the whole vast expanse of the lands and peoples ruled by both branches of the English-speaking race." He then paid a glowing tribute to the king and, continuing said:

"Let us hope that his reign will be a commercial reign; for that now means a reign where the chamber of commerce rules rather than the council of war, and where in consequence the arts and sciences flourish, prosperity not only prevails but is diffused, and where, while wealth accumulates, men do not decay, but advance through the paths of intelligent labor to increased leisure and material and moral elevation. The great and to some extent novel tasks which this city of Liverpool has already undertaken in these directions are watched from our side of the Atlantic with a keen and sympathetic interest. We observe the strides you have taken toward the ownership of public utilities; and are eager to see if and how you can in the long run and on a large scale, under a popular form of local government, give the world examples of public work in new fields done as efficiently, as economically, with as much promptness and as little corruption as private work. If for instance Liverpool can own its tramways, furnish accommodations equal to ours, with equal length of trips and readiness of transfers, and, without imposing unfair burdens on the taxpayer, or discriminating unduly between classes, can yet transport the public for a penny as against our twopence half-penny, we want to learn the secrets of your success. So, too, it concerns us to know if your city authorities can without unjust or oppressive taxation give a better, cheaper service to the public, and make it pay for itself, in furnishing electric light and power for all, in providing public laundries, and Turkish baths, and sterilized milk, and above all in tearing down unsanitary buildings in the slums and erecting in their stead good municipal homes for the poor. If you can do this continuously and successfully, with due regard for the rights of all, we shall be still keener to study your methods. That successful commerce is the true and munificent mother of art you have conspicuously shown. Where else has more been done of late years to encourage architecture, sculpture and painting? Or where have recent collections of art treasures been more splendidly housed?"

"That your commerce is as farseeing as it is successful you have equally shown. Where else have men built stone docks like those of Liverpool, so far in advance of the time, that even with the marvellous strides of ship building, in the last decade, the great liners of today, 600 and 700 ft. long, are yet hundreds of feet shorter than the solid masonry berths you have long had ready for them? May I add the satisfaction with which an old traveler observes that, thanks to your improvements in the channel, it is no longer necessary to set out on a sea voyage from your port on the open deck of a chilly and rain-swept little tug? Neither the Manchester ship-canal nor diversions to Southampton nor the growth of Hamburg would seem to have hurt you. The staple for the biggest single British industry, that of cotton, still passes almost entirely through this port, and your control of it is undisputed. On the imported food of Great Britain and on all your other great lines of imports your grip also appears unshaken. You remain easily the second seaport in the empire, and the first in the world in exchanges with any other one city.

"If you have thus sustained the threatened dangers of the recent past, you can surely face now with equanimity the terrors of Mr. Pierpont Morgan. It is not for me to speak for that most capable man, or for the great masses of capital he directs, and the great enterprises, largely American, which he represents. Still less would I think of hazarding an opinion, here and now, as to the wisdom or unwisdom of the huge combinations he is organizing, their desirability for investors, their safety for the business world, or their effect either on national interests or international relations. But as a mere onlooker, I venture to suggest that the apprehensions aroused by the recent changes in shipping with which his name has been identified appear somewhat exaggerated. In no case does your power to secure at will for your naval service as many cruisers as ever seem to be in the least imperilled. If built in your ship yards they are forbidden to pass under our flag, by a law almost as old as our history, and almost as hard to change as our constitution. If you accept what you think the gloomiest view as to the future control of the Atlantic carry-

ing trade, it does not follow that New York would use that control to weaken the port most important to it. Even monopolies are not supposed to thrive by damaging their best customers. Besides, the monopoly in this case is fanciful; it does not and cannot exist. Nature abhors a vacuum; and just so, organized society abhors a monopoly. All the forces of nature fight against any large formation of the one; and all the forces of civilization against the other. None has been created in this business; I think none is desired, and I know none can be long successful.

"But is it necessarily altogether disadvantageous to the trade of this great port to have at least some certainty as to its business, some knowledge of what it can count on, six months in advance? Surely nothing can come nearer reducing legitimate trade to gambling than such features of the old system as violent fluctuations in freights with cut-throat rates at a time of hungry competition, followed with efforts to recoup later, by sudden combinations on an excessive advance. When a company of men, no matter who, put an aggregation of capital so enormous afloat, in materials so perishable, while all the forces of trade tend to encourage the growth of rivals, the very law of such a company's being is steady and conservative management, together with that fair-minded liberality which is the necessary offspring of enlightened selfishness. Consider besides the advantages, to a nation sometimes said to be isolated and certainly not always loved, of a great neutral fleet in which its food might be borne in safety in spite of any possible enemy. These are certainly rifts in the new cloud, anyway!

"I said 'any possible enemy.' For I do not for one moment admit the possibility of war again between our own nations. Whatever else may happen, that—in this day and after our happy joint share in the advances of international law which have made arbitration an actuality instead of the old Arcadian dream—that is no longer thinkable. Nature revolts against it; all the interests of that vast body of English-speaking peoples who in both hemispheres, on all continents and seas, lead the world upward, forbid it.

"Men sometimes talk of our several efforts for the extension of our national trade as 'commercial war.' I protest against this theory that commerce, which is the herald of progress, the mistress of the arts, the handmaiden of civilization, is to be thought of as merely a war against our rivals. It is a false and low idea. It degrades commerce to the point of view of the horse jockey, who considers no trade regular in which each side is not trying to cheat the other, and in which at least one does not succeed in the effort. This chamber well knows—no great merchants ever fail to understand that—on the other hand, that trade is the best and most permanent in which both sides make a profit. Such is the colossal trade between these two ports of ours, in which you have borne so large a part and on which both Liverpool and New York have grown rich and great. Such I venture to think, but in far larger measure, will be that trade which is surely to be the new feature of twentieth century commerce, the trade of the farther east on the Pacific. We shall be rivals for it no doubt; but rivals in no more hostile sense than are neighboring merchants of Liverpool in their competition for the trade of New York, or neighboring merchants of New York in their competition for the trade of the west.

"We talk from time to time of this government or that approaching the situation, where, like ancient Rome, it can govern the world. That is an idle dream. History does not thus repeat itself. Neither your own great nation nor ours will ever rule the world or seek to. But the time does visibly draw near when solidarity of race if not of government is to prevail. There can be no question then what race is to press to the front in the material, the intellectual and the moral progress of the world; no question that its kindred peoples will march side by side, proud whichever is foremost, and filled only with a generous emulation each to lead the other in one common inspiring advance."

BABCOCK & WILCOX WATER-TUBE BOILERS.

The following quotation from the report of the committee appointed by the lords commissioners of the British admiralty to consider certain questions respecting modern types of boilers for naval purposes will be of interest to readers of the Review:

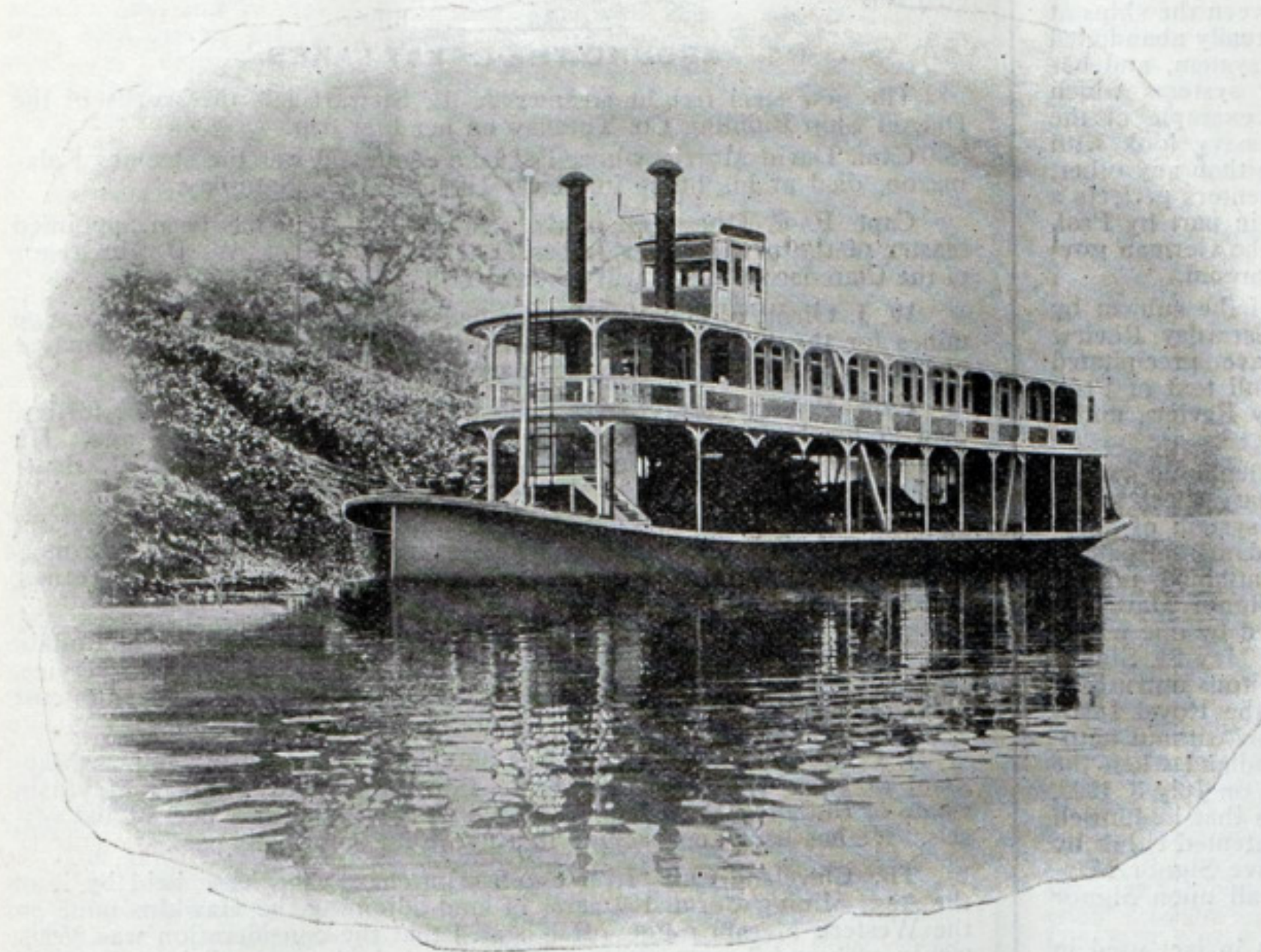
"In the course of their investigations, the committee have watched the Babcock & Wilcox boilers fitted in the steamship Martello of the Wilson line, employed in the Atlantic trade between Hull, Boston and New York, and copies of the reports of their inspections have from time to time been forwarded to their lordships. These inspections have taken place at the end of every round voyage for fourteen months, and the committee's opinion is that these boilers have stood the test of usage in the mercantile marine extremely well. The vessel has run about 91,000 miles since the boilers were put in, and has usually been less than a week in port at either end; the only repairs required have been those of the ordinary upkeep of any boiler, such as fire bars, brickwork, etc., and only six tubes have required renewal. This opinion is strengthened by the inspections of boilers of the same type fitted in the Numidian, the Buenos Ayrean and the Turret Cape. In the case of the last named vessel, the boilers have been in use seven years, and cannot have been as well looked after as they would have been in the navy, and their condition when examined recently was satisfactory. The committee have also examined and tested boilers of the same type in the Sheldrake and find that, although they have been in use for four years, their condition is good and they have given little trouble.

"From the information which has been brought to the notice of the committee, it appears that water-tube boilers are being very little used in large ships belonging to the mercantile marine, and that their use in such ships is increasing very slowly. In the British mercantile marine the only type of water-tube boiler installed in ocean-going vessels is the Babcock & Wilcox in some ships of the Wilson and the Peterson-Tate lines and in three ships of the Alian line; in these last, however, only one water-tube boiler is fitted in each vessel to assist the original cylindrical boilers. In the United States mercantile marine Babcock & Wilcox boilers are used to a small extent, principally in the ships plying on the great lakes. In the American navy many Babcock & Wilcox boilers are in use."

It is interesting to note that throughout their investigations, which lasted over a period of nearly two years, the committee were only able to examine into the merits of one type of water-tube boiler successfully operating in the merchant marine, and as will be seen by the foregoing, this was the Babcock & Wilcox.

SHALLOW-DRAUGHT RIVER STEAMERS.

The Marine Iron Works, station A., Chicago, makes a specialty of shallow-draught, stern-wheel boats, most of them for service on rivers and other shallow waterways that are far from Chicago. The vessels are erected according to the ingenious plan of "knock-down" construction developed by the Chicago concern. One of these steamers, now in service on the Chalchappi river, Mexico, at the Dos Rios plantation of the Mexican Gulf Agricultural Co., is illustrated herewith. The name of the vessel is Dos Rios and her principal dimensions with other particulars are:



MEXICAN RIVER STEAMER DOS RIOS.

Length of hull, 98½ ft.; length over all, 111½ ft.; beam outside of planking amidships, 22 ft. 8 in.; average draught with ordinary load, 24 in.; two direct-acting engines (non-condensing), 9x48; "Westriver" boiler, 40 in. by 16 ft., containing thirty-eight 3-in. tubes, each 16 ft. long; steam drum, 12x48; mud drum, 12x48; average working steam pressure, 165 lbs.; revolutions of paddle-wheel per minute, twenty-four; diameter of paddle-wheel, 12 ft.; length of buckets, 12 ft.; number of buckets, twelve; width of buckets, 16 in.

The fuel used is poor dead wood and yet the vessel is credited with having made 29 miles in 2 hours and 4 minutes through deep slack water. Capt. F. M. Pulver, writing the Marine Iron Works regarding the vessel, says: "The consumption of fuel per hour is about two-fifths of a cord on a 400-mile round-trip run. We made 28.6 miles per cord of wood burned, running at an average speed of 10 miles per hour. The velocity of current averaged about 3 miles per hour. This was her first round trip and we were often obliged to slow down, on account of snags and sand bars. At the allowed pressure of 200 lbs. and under favorable conditions, slack water, etc., the Dos Rios is capable of running at the rate of 15 miles per hour. I never saw a boat that would back to her rudders and handle so nicely. She will turn in her own length when backing, and make as short a turn as any stern-wheeler I ever saw when going ahead. Under good ordinary operating conditions, I can back her at the rate of 5 miles an hour in slack water. As to towing efficiency, I am not afraid to take hold of two barges, the size of herself, each with 100 tons load, and start up against a 3 or 4-mile current. This is saying a good deal, but she is certainly capable of shoving them."

The Chicago builders of this vessel always have on hand a large amount of work for foreign countries. Just now they are working on orders for Mexico, Turkey, Holland, Brazil, Guatemala, Bolivia, Ecuador, British Honduras and Cuba.

MALLORY LINE INCREASING ITS SERVICE.

Regarding the rumors that have been in circulation for a week or more, that the Mallory steamship line will move its southern terminal from Galveston to Mobile, the following statement has just been issued by C. H. Mallory & Co.:

"Reports that are being published in the press relative to Mallory line are so misleading that its patrons should be informed that not only will the Mallory line continue its present semi-weekly service between New York and Galveston direct, but it has recently contracted for a large freight and passenger steamship for this service, to enable it to increase its sailing. During the past year more than \$130,000 has been spent on its Galveston terminals, making them up to date in every particular and the equal of any. The Mallory line has about completed its arrangements for a regular steamship service between New York and Mobile, which will probably be inaugurated in September, but the service of the two lines will be distinct and separate. The Mallory line and Southern Pacific Co. are on friendly terms and work in harmony to all points and we are not opposed to each other."

For the first time vessels have now been built in Norway for America. On the 4th inst. two steel steamers, each of 1,200 registered tons, were launched from Fevig's yard at Arendal for the International Steamship Co. of Mobile. They will run in the banana trade between Port Antonio (Jamaica) and Mobile, but will also carry passengers.

NAVAL FORCE OF FRANCE.

Just before retiring from the office of minister of marine M. de Lanessan published an exhaustive study of the program of French naval construction which he had presented to the chamber. In virtue of that program the naval department should, by Jan. 1, 1907, have constructed six first-class ironclads of 14,865 tons each, five armored cruisers of 12,850 tons each and numerous torpedo boat and submarine craft. In expounding the arguments invoked in favor of the augmentation of the French fleet M. de Lanessan compares the naval forces of the republic with those of other nations. With regard to the ironclads, he says:

"The superiority of the English navy over that of France from the point of view of the number of ironclads is too considerable for us not to acknowledge and deplore it. It has, unfortunately, greatly increased during recent years by the fact of our having almost completely abandoned building new first-class ironclads, while England, on the contrary, continued actively adding to the number of ironclads she had already. However, if England possesses sixty-six first-class ironclads, whereas we have only twenty-six, the needs of England for them are much more extended than ours. The simple statement of the number of her ironclads and cruisers does not suffice to give a correct idea of the naval forces of which she could dispose in the European seas on the day war might break out between herself and a great naval continental power. In the first place, her commercial and political interests in the various seas of the world are so considerable and her merchant fleet in all the oceans of the globe is represented by such a large number of numerous war vessels everywhere. She employs a certain proportion of her ironclads in that service. In the second place, England cannot, in the European seas, avoid the necessity of dividing her squadrons between the channel and the Mediterranean without exposing herself to great danger. In the Mediterranean she must protect Gibraltar, Malta and Egypt. In the channel she must possess powerful squadrons to prevent the ruin of her commerce and to protect herself against the danger of a landing being effected on her coasts. In a word, England has many more ironclads than we because she has more interests to defend in various parts of the world."

M. de Lanessan also compares the French ironclads and those possessed by the powers of the triple alliance, and concludes that France should always possess twenty-eight first-class ironclads, which are indispensable for the formation of four squadrons of six ironclads each, with one ironclad always in reserve for each of the squadrons. Those four ironclad squadrons would, in the opinion of M. de Lanessan, amply suffice, because: "Having no intention of being the aggressor against any of our neighbors, we need seek in the organization of our fleet, as of our army, nothing more than the means of rendering ourselves sufficiently strong to deprive everyone of the desire to attack us. With four first-class ironclad squadrons grouped in the channel and Mediterranean, the principal body of our fleet will be very strong. Its power will, moreover, be considerably increased by all the ironclads forming the squadrons of the second line and by the ironclad coast-guard vessels, of which a certain number are capable of rendering excellent service for many years to come."

Examining the question of armored cruisers, M. de Lanessan insists that they should be of the most perfect type to be capable of rendering the service expected of them. At the beginning of the present year, 1902, France possessed on the seas, or in course of construction, thirty-three armored cruisers, three of which steamed at the speed of 23 knots and the other thirty at speeds varying between 18 and 20 knots. In addition to these vessels, at the end of 1906 the French will have five ironclad cruisers of 12,500 tons, steaming at a speed of 22 knots. At the same moment England will possess 130 armored cruisers and fourteen ironclad cruisers of 14,000 tons, steaming at a speed of 23 knots; six of 12,000 tons, with a speed of 21 knots, and four of 9,800 tons, with a speed of 21 knots.

M. de Lanessan is not a partisan of privateering and of seeking to prey on the commerce of the enemy. To support his view he invokes the results of such enterprises in former times. Going back to the very origin of such feats of naval warfare, he shows that though a large number of English vessels were frequently captured, the effect was very insignificant. During the conflict for the Spanish succession—from 1698 to 1715—the French privateers preyed on the English commerce with great success, but the only result was that England snatched from Holland the little that remained of her commerce, became the mistress of Gibraltar in the Mediterranean, where she ruled uncontested mistress, and in America seized Nova Scotia and Newfoundland. The object pursued in that war by England having been the destruction of the French maritime power was, says M. de Lanessan, partly attained. The third phase of privateering warfare was during the conflict for the Austrian succession—1740 to 1748—but France only saved her colonies by the success of her arms on the continent. During the Seven Years' war—from 1756 to 1763—the lucrative operations of the French privateersmen did not prevent England from capturing a portion of the French colonies and from enormously increasing her maritime and colonial power. However, France had during those seven years captured of the English 3,300 merchant vessels, and had lost only about 1,000. During the wars of the Revolution the French privateers captured (from 1793 to 1797) some 2,000 English merchant ships, but the political results of the privateering were almost null, and the prosperity of England went on augmenting while the maritime commerce of France was almost completely stopped. If England only captured 375 French ships, while the French took 2,226 English vessels, it was, as M. de Lanessan admits, because the few French vessels which existed dared not venture to sea.

Japan intends to build ten ships of war at a cost of \$50,000,000 and to spread the expenditure over a period of six years.

MARCONI NOT THE REAL INVENTOR.

A dispatch from Washington announces that experts on wireless telegraphy were not surprised by the revelation made by Marconi himself, according to the cable dispatches from London, that he is not the real inventor of the system which bears his name. While it was not known that the Marquis Luigi Solari had devised the plan on which Marconi had been working for a year or more, still it was reported to Washington through scientific sources in Europe several months ago that an officer of the Italian navy was entitled to the credit that was being given to the supposed originator of the system of communication between the ships at sea and the mainland. The navy department long ago virtually abandoned hope of securing the desired results from the Marconi system, and has been experimenting quietly but persistently with other systems which have given more satisfaction. Following the reported example of the German government, the experts in the United States navy look with more favor at the present time on the Slaby-Arco system than any other, and unless some one of the scores of industrious experimenters perfects a better plan than that devised in part by Prof. Slaby and in part by Prof. Arco, the American navy is likely to continue to regard the German government's judgment of more value than that of Signor Marconi.

An interesting light was thrown on the discussion of the subject by the production in London of a communication in the Saturday Review by Prof. Sylvanus P. Thompson, which appears to have precipitated Signor Marconi's most recent move. Following is the full text of Prof. Thompson's communication to the editor of the Saturday Review, under date of July 9, 1902:

"On May 10 I pointed out in your columns that a telephonic system of reception had been used by Signor Marconi in February, 1902, in his Newfoundland experiments, in place of the telegraphic system of automatic tappers and telegraphic relays described in his fundamental patent. My words were: 'The great transatlantic success was attained, not by any use whatever of the basic patent of June 2, 1896 (Signor Marconi's patent), but by a new and totally different system, invented by one whose name has not been given to the public.' Whereupon, on May 24, Signor Marconi replied with an accusation of 'absolute and gratuitous untruth.'

"On Friday, June 13, Signor Marconi, lecturing at the Royal Institution, stated that this new system of telephonic reception without automatic tappers or telegraphic relays was used in Newfoundland when the first signals were received from across the Atlantic. And on July 3, 1902, Lieut. Solari, of the Italian navy, announced in the Times that he himself was the inventor of this appliance, that it had not been patented either by himself or by Signor Marconi, and that he personally gave Signor Marconi the apparatus used in Newfoundland. I therefore call upon Signor Marconi to admit:

"First—That this system of telephonic reception was in fact used in Newfoundland when the first signals were received from across the Atlantic, and is different from the telegraphic system described in his patent of June 2, 1896.

"Second—That the name of the inventor had not in fact been made public prior to May 10, 1902, and at the same time that he makes this admission I shall expect from him, as a gentleman, that he will withdraw the charge of absolute and gratuitous untruth which on May 24 he made in your columns."

SHIP YARD NOTES.

Atlantic Power Barge Co. of Baltimore, Md., is the title of a new concern. The object of the company is to build and operate barges driven by gas engines. The new company is to build a light-draught twin-screw barge, propelled by two gas engines and having every facility for rapidly loading and discharging her own cargoes. Dimensions are as follows: Length, 160 ft.; beam, 23 ft. 10 in.; depth, 12 ft.; draught, loaded, 10 ft. 6 in.; capacity, 800 tons. The incorporators are G. Stewart Wise, a steamship man; B. A. Sinn, a naval architect; and Capt. McLeod, a master mariner, all of Baltimore.

William E. Woodall & Co., Baltimore, Md., launched the passenger propeller Memphis lately. She was christened by Miss Mary E. Woodall. The Memphis has been reconstructed from the old vessel of that name which was burned to the water's edge at Norfolk some time ago. The hull is practically new and all the joiner work is entirely new. The dimensions of the Memphis are: Length, 116 ft.; beam, 23 ft.; depth, 10 ft. She will have a compound engine, which is being put in by the James Clark Co. The Memphis is owned by the Southern Railway Co.

The Ward Engineering Works, Charlestown, W. Va., is building a twin-screw steel towboat for service in connection with the improvement of the Great Kanawha river. Following are the dimensions: Length, 120 ft.; beam, molded, 22 ft.; over guard, 24 ft. 8 in.; depth, 4 ft. 3 in.; draught, 30 in.; contract speed, 12 miles an hour. She has two quadruple-expansion engines with cylinders 7, 10, 14 and 20 in. in diameter and 12-in. stroke.

FROM DELAWARE RIVER SHIP YARDS.

Philadelphia, July 30.—The Delaware River Ship & Engine Building Co., who purchased the Roach Ship Yard at Chester about a month ago, has already begun a series of improvements which, when completed, will make the yard one of the finest and most up-to-date in the country. New tools have been purchased for all departments. The principal improvement, however, will be a new sectional dry dock, large enough to accommodate the largest vessels afloat. Work on the dock will be begun at once. At this yard the keel of a steamer for the Ocean Steamship Co. of Savannah has just been laid. This vessel will be a sister ship for the City of Memphis, built at the same yard, and when completed will be added to the steamship company's fleet plying between Savannah and New York.

Apropos of the controversy between Senator Matthew Stanley Quay and Governor William A. Stone, comes an incident which shows that even ship building interests are not outside the pale of politics. The cruiser Pennsylvania is rapidly nearing completion at Cramps. According to all tradition and precedent Governor Stone's daughter should have been chosen as sponsor for the Pennsylvania, and until recently it was generally understood that Miss Jean Stone would officiate. Last week though, the Cramps announced that Miss Quay, daughter of the

senator, had accepted and would break the bottle of wine and christen the Pennsylvania at the launching.

The Cramps have placed an order with J. J. Pusey, mayor of Havre de Grace, Md., and a boat builder, for a number of life boats for vessels now in course of construction at their Kensington yards.

The Clyde liner Apache, which has been cut in half at Cramps' and lengthened, will be ready to leave the dry dock in about three weeks. In the 52-ft. section between what was the Apache's prow and stern, the ribs are already in place and the ½-in. steel side plates are being riveted on.

AROUND THE GREAT LAKES.

The new steel freight steamer A. E. Stewart left the works of the Detroit Ship Building Co. Tuesday on her first trip.

Capt. David Morris, whose last lake command was the steamer Kalamazoo, died at his home in South Haven, Mich., Saturday.

Capt. F. P. Houghton of the steamer J. J. Hill has been appointed master of the new steamer James H. Hoyt, and Capt. W. B. McGregor of the Clarence A. Black will take the Hill.

W. J. Olcott of Duluth, who has been superintendent of Mesabi range mines for the United States Steel Corporation, has been made manager of mines for the corporation, his new duties covering all ranges.

Capt. Robert Montgomery, who sailed the lakes back in the forties, died at his home in Willoughby near Cleveland, a few days ago. He owned and commanded the old Missouri, the Sun and the J. R. Bentley.

It is again said that Capt. Mart. Swain of Detroit, veteran wrecking master of the lakes, is about to retire. Capt. Harrow of Port Huron is spoken of as Capt. Swain's successor in command of the wrecking steamer Favorite.

The new side-wheel steamer Eastern States of the Detroit & Buffalo line, which met with an accident to her machinery, is again in service, after an idleness of three weeks. It is said that the machinery repairs cost about \$7,000.

J. C. Gilchrist of Cleveland has purchased the steamer Thomas Maytham of John Kilderhouse and the Edward C. and Thomas Maytham estate of Buffalo. Mr. Gilchrist is said to be aiming at a fleet of 100 vessels. He has been approaching that figure for some time past.

The Cleveland-Cliffs Iron Co. has purchased the lease held by it of the Acsa Mining Co. of 160 acres of land adjoining the Hawkins mine on the Western Mesabi range. It is stated that the consideration was \$500,000 in cash and 7 cents per ton on all ore now shown up (about 5,000,000 tons) and all yet to be found, and a royalty of 20 cents per ton on all ore mined. It is estimated that the tract contains fully 10,000,000 tons of ore.

The Lackawanna Steel Co. of Buffalo has let the contract for an immense ore dock to be built on the banks of the canal now in construction at the steel plant at Stony point. The contract involves the sum of \$800,000. The dock will be one of the most extensive in the country. It is to be built wholly of concrete and will be reinforced by iron lathing. It will be three-quarters of a mile in length and 280 ft. wide. The dock is to be finished in seven months.

Big harbor improvement contracts will be let shortly by Major Kingman, United States engineer of Cleveland. He advertises elsewhere in this issue for bids on the work of extending the east arm of the Cleveland breakwater and the building of converging arms of breakwater for protection to the harbor entrance. The two jobs involve an expenditure of about \$2,800,000. At West Superior, Wis., harbor entrance improvements involving an expenditure of about \$1,000,000 are to be started. Two piers at West Superior are to be the largest monolithic concrete piers ever built in the United States. They will be solid concrete, from the foundations, 25 ft. below water level, to the top, 10 ft. above water, and they will be 3,200 ft. long.

Four books, comprising complete sailing directions of the great lakes, have just been completed by the United States hydrographic office. The sailor is certainly fortunate in having the government furnish him books of information of this kind. They are sold at 40 to 50 cents each, which is merely cost of paper and press work. They could not be compiled and published by private enterprise at a cost of several dollars each. Besides giving very minute descriptions of all harbors, courses, aids to navigation, etc., they contain a great deal of valuable information, such as distances between ports in statute miles, rules of the road (White law), the barometer and the law of storms, use of oil at sea, storm signal stations, life saving stations, variation of the compass, use of azimuth tables, registration of letters at marine postoffices, etc.

In his forthcoming report Rear Admiral Taylor, chief of the bureau of navigation, will advocate the employment of civilians as professors at the naval academy. The fourth class at the naval academy during the coming winter will contain more than 200 midshipmen, and the present force of instructors will not be able to handle them. It will therefore be necessary to detail additional naval officers to duty at the academy. In view of the great demand for naval officers for sea service the department is reluctant to permanently increase the number at the naval academy, but in view of the conditions it will have to be done unless legislative authority is obtained for the employment of an increased number of civilian instructors.

Marconi's Wireless Telegraph Co., Ltd., announce that they have the following coast stations for ship communication now in working order: England—Withernsea (Hull), Caister, North Foreland, St. Catherine's, The Lizard, Holyhead. Ireland—Rosselare, Crookhaven, Malin Head, Inishtrahull. On the continent there are stations at La Panne near Ostend, Borkum lighthouse and the Borkum lightship. In the United States there are two stations, one at the Nantucket lightship, and the other at Siasconset; while Canada has two stations, Belle Isle and Chateau Bay. The Allan line, which a month or so ago fitted up their Parisian with the Marconi apparatus, have now equipped their Tunisian, Bavarian and Ionian.

ICE BREAKERS ON LAKE BAIKAL.

For some years past the Russian government has had ice breaking steamers stationed at two important points of the great Siberian railway, namely, at Vladivostok, the terminus on the Pacific ocean, and on Lake Baikal, between the two stations on the opposite shores of the lake. The business of these ice-breakers is to keep open the goods and passenger traffic passing over the railway and on the water as far as possible even during the rigors of the northern winter. Up to five years ago the port of Vladivostok was regularly cut off from the outer world from November to March by a crust of ice from 5 to 8 ft. thick. During these winter months overland communication with European Russia was maintained with difficulty by means of a slow and inadequate service of miserable mail vans (Tarantas), but since the completion of the section of the railway between Chaborovsk and Vladivostok in 1897, the ice-breaker Nadorschnie (built at Copenhagen) has kept free from ice a stretch of twelve to fifteen miles from the harbor entrance to the open sea, assisted by three smaller steamers which pass continually up and down the channel to prevent ice accumulation in the fairway. All through last winter—a very severe one—with the thermometer often down to 30° or 40° Réaumur, the Nadorschnie did her work in an excellent manner and, according to published reports, the entry and departure of steamers of the largest dimensions were effected without the least damage or difficulty. The Nadorschnie breaks through a crust of ice 7 ft. thick with the greatest ease, and up to the present has only been hindered in the accomplishment of her task by a thickness of 14 ft. In view of the greater capabilities of modern ice-breakers there is now a prospect of keeping the sea traffic with Vladivostok permanently open in future, whatever may be the consistency of the ice. Not only will this be of immense advantage as regards the sea communication with Europe, but it will also be a great boon to the steamship service of the East Chinese Railway Co., and of much importance to the new line connecting with the Japanese free harbor of Tsuruga, between which port and Vladivostok the Japanese steamer Kozu Maru will soon commence running with the intention of keeping up a regular service all the year round. The Nadorschnie has a displacement of 1,525 tons. Her length is 198 ft. and her width 42 ft. 6 in. Her engines are of 3,200 H. P. She has four boilers, and she can make her way through 6 in. of ice at the rate of 5 knots per hour. She can also be utilized for salvage operations in pumping out the water from a ship's hull, being able to raise 1,700 tons of water in five hours. She was paid for out of the Siberian railway fund. It is said to be the intention to station another and more powerful ice-breaker at Vladivostok, to be built especially for the purpose.

The great freshwater lake of Baikal is covered every winter with a crust of ice several feet thick which stops all navigation from December to April, and the communications across the lake had formerly to be kept up by a service of sledges. But this mode of conveyance has long ceased to be adequate for the immense traffic across the lake which has sprung up of late years, and the two stations of the Siberian railway on the opposite sides of the lake (Listwitschnoje and Bojarskaja) are in future to be kept in communication during the winter by means of powerful ice-breaking steamers. For this purpose two of these craft—the Baikal and the Angara—have been put on the lake to preserve an open channel for navigation from shore to shore, the length of which is about 46 English miles. The Baikal is one of the largest ice-breakers at present existing, with an extra strong steel hull and a protecting girdle at the water line. Her length is 290 ft., width 57 ft., and her draught is 18 ft. forward and 20 ft. aft, and with a displacement of 4,200 tons she can steam at 12 knots per hour. She has three four-bladed propellers driven by three triple-expansion engines of 1,250 I. H. P. each, and she can move ahead or astern with equal facility. Along her deck are laid three sets of rails, affording accommodation for twenty-five railway cars, besides which she has cabins for 150 passengers. The other boat—the Angara—which was only put into the service in 1900, is 195 ft. long and 34 ft. wide, her draught is 15 ft., and her speed 12½ knots. This boat has also three triple-expansion engines of 1,250 I. H. P. each, and she is intended principally for the conveyance of passengers. She is not of sufficient power and weight to force her way through ice of any great thickness, so that, as a rule, she has to follow in the wake of her more powerful sister. The chief difficulty of the winter passage across the lake consists of the accumulation of ice-blocks, which, in an inland lake, have no opportunity of floating away as they can in the open sea with the ebb and flow of the tide. The total cost of providing this lake line of ice-breakers—including a floating dock, not yet finished, and a repairing-yard, now being laid down, together with great dams for berthing places—is estimated at 5,621,000 roubles.

JONES & LAUGHLINS, LTD., REORGANIZED.

Jones & Laughlins, Ltd., of Pittsburg, has been reorganized as the Jones & Laughlin Steel Co. with a capital stock of \$30,000,000, which is an increase of \$10,000,000 over the capital of the limited partnership. The new capital is reported to represent the book value of the property. Provision has also been made for an issue of \$10,000,000 of bonds, which will be used for improvements. It is understood that none of the stocks or bonds will be offered to the public—at least not for the present. The limitation of the present partnership is the prime reason for the change to a corporation, coupled with the desire to secure broader powers. The ownership and policy of the company remain the same, and the officers and directors are virtually those who have been at the head of affairs since the reorganization of the partnership. The members of the advisory board become directors, and all of the old managers become directors, with some additions. The new company will operate as heretofore the Vesta Coal Co., which is opening large mines at Coal Center; the Interstate Iron Co.; the Blair Limestone Co., Ltd.; Monongahela Connecting Railroad; Blair Supply Co., Ltd., and the Angeline Dock Co.

The directors of the company are B. F. Jones, Henry A. Laughlin, George M. Laughlin, James Laughlin, jr., and B. F. Jones, jr., who have been members of the advisory board; Willis L. King, William Larimer Jones, Thomas O'Connor Jones, Irwin B. Laughlin, J. B. Laughlin, W. C. Moreland and Roland Gerry, who have been members of the board of managers, and W. W. Willock, who has had charge of the Monongahela Connecting Railroad; Robert Geddis and Henry S. Kiehl. B. F. Jones, jr., who has been chairman, will become president; Willis L. King, who has been vice-chairman, will be vice-president; W. L. Jones

will continue as general manager; Irwin B. Laughlin, treasurer; T. K. Laughlin, assistant treasurer; W. C. Moreland, secretary, and Wendell Van Hook, auditor.

It is understood to be the intention of the company to make extensive improvements that will expand it into the largest and most aggressive competitor of the United States Steel Corporation. During the past two or three years the firm has expended from \$5,000,000 to \$6,000,000 in bringing its plant to the highest standard and in increasing the output. It has sought to make itself absolutely independent as to raw material; has opened new ore mines in the Mesabi ore country; has bought and opened extensive coal tracts on the Monongahela, with developments at Coal Center; has rebuilt and added blast furnaces; has installed new mills, increased its yard facilities, rebuilt its bridge and connecting railroad, and has made its plant one of the finest and most compact in the United States. Even with these extensive improvements it is said that the company is merely beginning to broaden and develop. Its progress in the past two years has been remarkable.

SHIP BUILDING INDUSTRY OF GERMANY.

A work just published in Germany, based on information collected by the imperial naval department, contains some interesting particulars on the subject of the position of the ship building industry of Germany. One of the principal facts established is that the business of building ships in Germany has developed far more rapidly in the last three decades than the owning and working of them. The number of ship yards capable of turning out iron sea-going vessels and the amount of capital invested in them from 1870 downward, is shown in the following table:

1870—Seven yards with a capital of.....	4,800,000 marks
1880—Eighteen yards with a capital of.....	15,300,000 “
1890—Twenty-five yards with a capital of.....	36,100,000 “
1900—Thirty-nine yards with a capital of....	66,000,000 “

Up to the end of 1901 it is estimated that the capital invested had increased to 90 or 95,000,000 marks. This is a gigantic stride to be taken in thirty years, and the Germans are quite justified in boasting that ship building has come to be one of their most important industries. The profit-earning capabilities of the yards fluctuate, as is only natural, according to the amount of capital invested and other circumstances. Thirteen yards are brought together in a table contained in the work above alluded to (published by Messrs. Schwarz & Halle, Berlin), namely, the Stettin Vulcan, Oderwerke, Neptun, Howaldtswerke, Germania, Flensburg Co., Blohm & Voss, Reiherstieg, Janssen & Schmilinsky, Weser, Bremen Vulcan, Tecklenborg, and Seebeck. The average dividends paid by these establishments in the years 1890-1900 were 10.05, 8.29, 7.89, 6.71, 5.55, 5.00, 4.98, 6.59, 6.08, 6.98 and 8.15 per cent. The activity at all these yards has, of course, been gradually increasing with the growth of their internal development and self-dependence, and the policy adopted by the government in building German war vessels in German yards, and in stipulating in the subvention contracts that all mail steamers taking state aid shall also be built at home, has contributed not a little towards the development and prosperity of the ship building trade as a national industry. The value of the work turned out from ten of the largest yards in the years 1871 to 1880 was 6,500,000 marks, while in the years 1881 to 1890 the value was 88,000,000, and in the years 1891 to 1896 about 103,000,000. In the seventies, therefore, the annual value of work performed was 6,500,000 marks, 8,800,000 in the eighties, and 17,000,000 in the nineties up to 1896. In 1898, however, work to the value of 84,000,000 marks was executed at twenty-four of the largest establishments, while from eighteen of the principal yards in the years 1896 to 1900 work was turned out to the value of 331,000,000 marks. These statistics had to be compiled before the returns had come in from all the yards (three of the largest being among the omissions), but enough is given to show that with official support and under favoring circumstances, the German ship building trade is increasing in extent and importance.

A LARGE FOREIGN BUSINESS.

A few orders, noted herewith, which were recently received through branch houses, indicates the extent of foreign business now conducted by the Buffalo Forge Co., Buffalo, N. Y.:

Two 70-in. steel plate steam fans for heating and ventilating, direct connected to two Buffalo Forge Co. engines, and one 130-in. three-quarter housing standard steel plate pulley fan for mechanical draft are to be shipped to Copenhagen, Denmark.

One induced draft plant and one engine of 23 H. P. for electric light plant in Dutch Guiana, South America.

Five Buffalo engines of 45 H. P. each for driving generators and one engine of 38 H. P. for a pumping equipment to be installed in a sugar factory now being built near Manzanillo on the south side of Cuba.

One Buffalo vertical class "A" engine of 20 H. P. to be shipped to Gestemunde, Germany.

One double vertical single-acting Buffalo engine of 15 H. P. to go to Gothenburg, Sweden.

One 60-in. standard steel plate fan for ventilation to be shipped near Glasgow, Scotland.

One 140-in. steel plate fan with heaters complete for heating and ventilation to go to Barrow-in-Furness, Eng.

One standard 80-in. fan and heater complete and one 90-in. pulley fan for ventilation and one horizontal Buffalo engine of 30 H. P. to go to London, Eng.

One 120-in. fan and six 60-in. fans for Manchester, Eng.

One 80-in. standard steel plate fan for mechanical draft to go to Victoria, B. C.

One 110-in. steel plate pulley fan, direct connected to a cylinder above shaft Buffalo engine, for mechanical draft, to go to Halifax, N. S.

One 70-in. fan and one 100-in. fan for heating and ventilating purposes, to go to Portland, Ore.

One standard 40-in. steel plate fan to go to College Station, Tex.

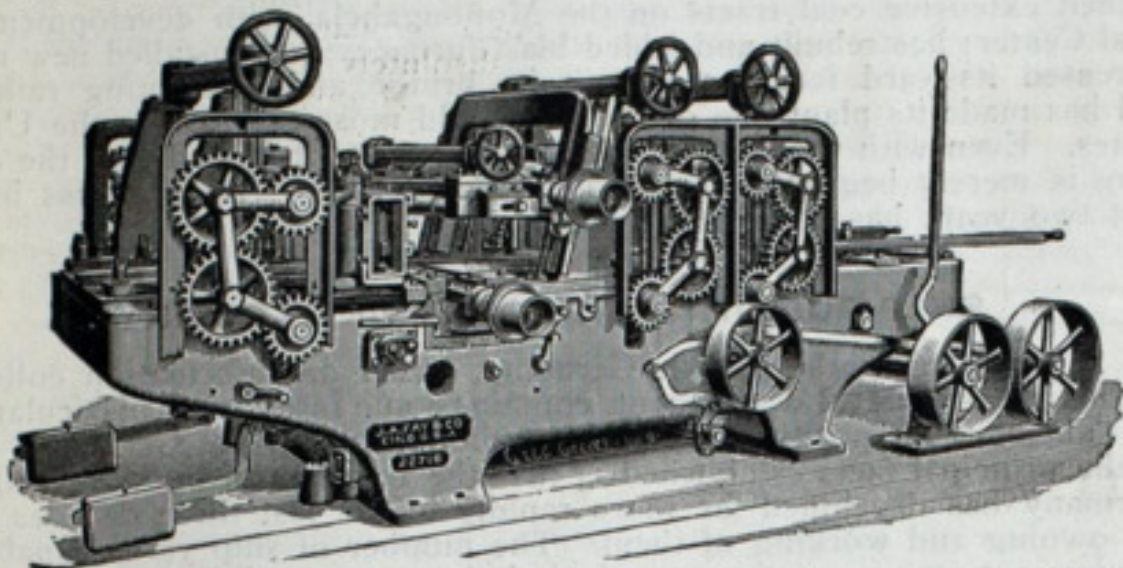
One 100-in. steel plate fan direct connected to a Buffalo single vertical engine, to go to San Francisco, Cal.

Two special 60-in. steel plate fans to go to New Orleans, La.

One horizontal Buffalo engine of 25 H. P. to go to Gretna, La.

LARGE TIMBER PLANER AND JOINER.

A desirable machine for ship yards and other places where large timbers are worked is shown herewith. It is powerful and substantial, and is designed for heavy work and a lot of it. It will plane two or four sides to 30 in. wide and 16 in. thick, and will plane two sides and one edge of two pieces to 13 in. wide and 16 in. thick, by the use of divided feed rolls and bars. The feed is six large rolls, powerfully driven and fitted with expansion gearing. Upper feeding-in rolls are divided to allow material of different thicknesses to be planed at one operation, and can



also be instantly lifted off the lumber. An attachment is provided for easily raising upper rolls and cylinder for variation in thickness of stock, and they can also be instantly raised either together or independently. The feed is steady and uniform, and can always be relied on to give satisfaction. It is under instant control of the operator, and its rate can be changed as desired. The pressure bar in advance of the cut is divided

and can be easily lifted for different thicknesses. The bar after the upper cylinder serves as a pressure bar over the lower cylinder, and has a pressure roll on each side, the pressure of which can be varied.

All the different adjustments are easily and accurately made, as the main endeavor of the makers has been to secure a labor-saving machine, easy and efficient in operation, and also to reduce to a minimum time required in making changes. The makers, J. A. Fay & Egan Co., of Nos. 325 to 345 West Front street, Cincinnati, O., will be pleased to send to those interested their new cuts, prices and particulars, and will also send their new and complete catalogue showing every machine they make.

William E. Woodall & Co. of Baltimore have received an order from the Southern Railway for two covered barges for use in the harbor of Norfolk, each to be 125 ft. long, 28 ft. beam, and to be built of wood.

Cabins and ..Staterooms

of modern vessels especially those in the passenger service should demonstrate the supreme possibilities of the wood finisher's art.

This demands a special varnish however, as atmospheric conditions are more destructive to varnish afloat than ashore and the ordinary article is of but little use.

The varnish best adapted to withstand the deleterious influences of wind, wave and weather is "BERRY BROTHERS' SPAR VARNISH."

Further particulars and a unique marine puzzle sent free for the asking. Write us.

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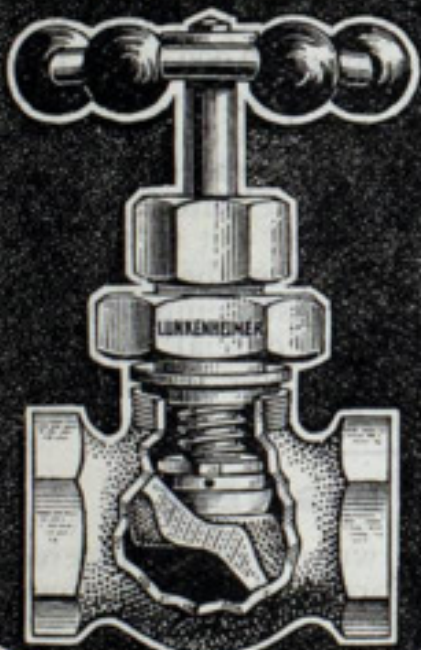
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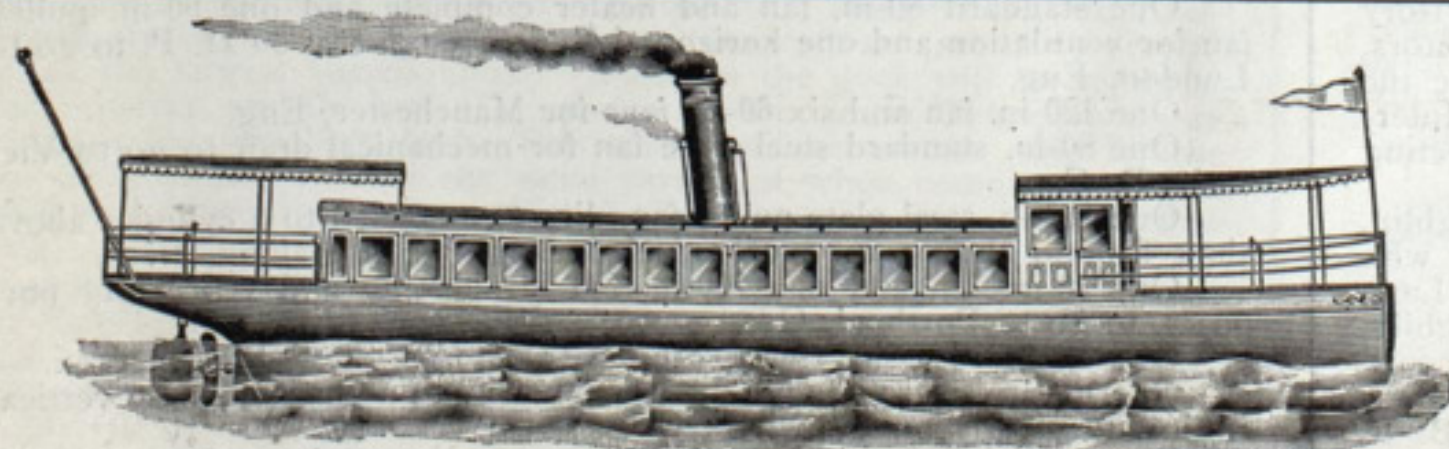
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TRADE NOTES.

The Atlantic Works Incorporated of Philadelphia, Pa., recently shipped one of their band saw setting and filing machines to the United States government for use in the Norfolk (Va.) navy yard.

Mr. Guy Norman of Newport, a member of the New York Yacht Club, has sold his speedy yacht Hope to Mr. E. Pierson Beebe of Boston. The transfer was made through the office of Frank N. Tandy. The Hope was designed last year by Mr. Arthur Binney, and built by the Gas Engine & Power Co., Morris Heights, N. Y. Mr. Beebe will use the boat around Boston and Falmouth, Mass.

Among the recent contracts awarded to the Buffalo Forge Co., of Buffalo, N. Y., is one of special interest, that of the Continental Coal Co. of Glouster, O. They have ordered three 250-in. fans installed in their mines, for the purpose of ventilating and exhausting fumes, smoke and all dangerous gases constantly met with in coal mining. The fans are 250-in., housing of the three-quarter type, and of the special width of 72 in. The sides are built of extra heavy steel plate and are thoroughly braced with angle irons of ample size, effectually preventing all vibration. The blast wheels of these fans are of the usual centrifugal type. The radial blades or vanes, with backwardly curved tips, are supported by two spiders of wrought iron tees springing from cast iron hubs and are further stiffened by the conical side plates. The fan shaft is supported independent of the housing by two standard Buffalo self-aligning, chain-oiling, outboard bearings mounted on masonry pedestals. This plant is similar in many respects to that of the Madoc Coal Mining Co., located at the same place and recently installed by the Buffalo company.

Position Wanted by Marine Engineer.

Marine engineer, technical education, shop and marine experience, at present in charge of engine department with large concern in middle west, desires a change. Member A. S. M. E.; age 40; married. Address Box 30, the Marine Review Pub. Co., Wade building, Cleveland. Aug. 7.

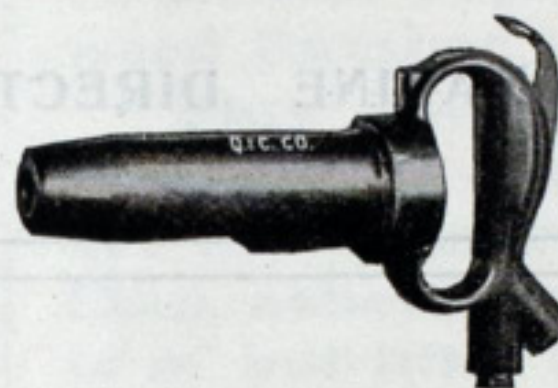
Proposals for the Improvement and Enlarging of Cleveland Harbor, Ohio: U. S. Engineer Office, No. 185 Euclid Ave., July 28th, 1902. Sealed proposals for the improvement and enlargement of Cleveland Harbor, Ohio, by extending the main breakwater eastward will be received at this office until 2 p. m. August 28th, 1902, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. MAJOR DAN C. KINGMAN, Corps of Engineers, U. S. A. Aug. 21

U. S. Engineer Office, Buffalo, N. Y., July 26, 1902. Sealed proposals for dredging and construction work at Erie Harbor, Pa., will be received here until 11 a. m., August 15, 1902, and then opened. Information on application. T. W. SYMONS, Major, Corps of Engineers. Aug. 7

Proposals for Improving the Main Entrance to Cleveland Harbor, Ohio: U. S. Engineer Office, No. 185 Euclid Ave., Cleveland, Ohio, July 28th, 1902. Sealed proposals for improving the main entrance to Cleveland Harbor, Ohio, will be received at this office until 2 p. m. August 28th, 1902, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. MAJOR DAN C. KINGMAN, Corps of Engineers, U. S. A. Aug. 21

U. S. Engineer Office, Milwaukee, Wis., July 28th, 1902. Sealed proposals for dredging at Menominee Harbor and River, Mich., and Green Bay Harbor, Wis., will be received here until 12 noon, standard time, August 15th, 1902, and then publicly opened. Information furnished on application. J. G. WARREN, Major, Engineers. Aug. 7

U. S. Engineer Office, Buffalo, N. Y., July 23, 1902. Sealed proposals for hire of dredging plant for excavation in Niagara River and Tonawanda Harbor will be received here until 11 a. m., August 22, 1902, and then opened. Information on application. T. W. SYMONS, Major, Corps of Engineers. Aug. 14.



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Year.	Australien	Polynésien	Armand Béhic	Ville de la Ciotat	Ernest Simons	Chili	Cordillère	Laos	Indus	Tonkin	Annam	Atlantique
1890.....	67,728	2,460										
1891.....	68,247	68,331	204									
1892.....	68,247	68,403	69,822	23,259								
1893.....	68,379	68,343	68,286	68,247								
1894.....	68,439	68,367	68,574	68,439	37,701							
1895.....	68,673	68,766	68,739	68,808	40,887	28,713						
1896.....	69,534	92,718	69,696	69,549	62,205	63,153	40,716					
1897.....	68,250	69,606	92,736	69,555	62,235	76,110	63,357	43,146				
1898.....	70,938	69,534	69,552	69,597	62,526	63,240	63,240	62,553	63,954	22,707		
1899.....	69,534	69,615	67,431	90,405	60,246	62,778	62,868	52,344	54,855	44,007	22,884	
1900.....	69,534	67,494	69,744	69,564	61,719	62,382	62,502	51,471	53,373	62,016	63,066	52,140
1901.....	44,220	69,627	69,594	66,948	51,057	62,460	62,490	61,743	62,688	43,866	62,466	63,126
Total.....	801,723	783,264	714,378	664,371	438,576	418,836	355,173	271,257	234,870	172,596	148,416	115,266

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